

The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XVI. No. 407

APRIL 16, 1927

Prepaid Annual Subscription:
United Kingdom, £1.1.0; Abroad, £1.6.0.

Contents

	PAGE
EDITORIAL NOTES: Two New Books; A Tax on Enterprise; The B.D.C. Annual Meeting; The Budget	371
CORRESPONDENCE: "The Institute and the Chemist"; "The Position of the Chemist"	373
The Dust Hazard in Industry	374
The Yellowing of Drying Oils: Oil and Colour Chemists' Discussion	376
"C.A." Queries: Chemical Matters in Parliament	377
From Week to Week	378
References to Current Literature	379
Patent Literature	380
Weekly Chemical Prices and Market Reports	383
Company News; New Chemical Trade Marks; Chemical Trade Inquiries, etc.	388
Commercial Intelligence; New Companies Registered	390
THE CHINA CLAY TRADE REVIEW	1-12

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.

Editorial and General Offices: Bouverie House, 154, Fleet Street, London, E.C.4.

Telegrams: "Allangas, Fleet, London" Telephone: City 0244

Two New Books

Two new chemical books of more than usual interest are announced by Ernest Benn, Ltd.—one already out and the other ready for issue. The first is *The Art and Principles of Chemistry*, by Professor H. E. Armstrong (pp. 276, 15s.); the second is *Artificial Fertilisers: Their Chemistry, Manufacture, and Application*, by P. Parrish and A. Ogilvie, with a Foreword by Dr. H. C. Brown (45s.). Prof. Armstrong's book is characteristically dedicated to "My seven grandsons and my seven granddaughters, hoping that one or more may develop the individuality to think for him or herself and not bow the knee to authority." The volume is one of collected essays, including parts of the first Messel lecture, and they are good examples of the Professor's style, both as scientific thinker and as writer. In the introduction the author exhibits, in its brightest form, the individuality to think for himself that he desires to see in his descendants. He states frankly that he is still of too active a disposition to be satisfied with the calm seclusion afforded by the *Encyclopædia Britannica*, or by so reputable a body as the Royal Society. Having no Ostwald, he has decided to act as his own trumpeter. He is seeking a hearing for interpretations which were advanced before Arrhenius was recognised, developed without the slightest knowledge of his speculations, brought before

the Chemical Society and the British Association in 1885, the Royal Society in 1886, and often amplified in the interval.

The work on artificial fertilisers is by two of our best authorities, both theoretical and technical, and it should meet a wide need for so authoritative a text-book. The present volume deals with all stages in the manufacture of phosphatic fertilisers, treating fully of technique and plant equipment. For a complete survey of the field of artificial fertilisers a further volume will be required later.

A Tax on Enterprise

SIR ALFRED MOND recently drew attention to the enormous sum paid in duties in connection with the formation of Imperial Chemical Industries, Ltd., the total expenses of what is essentially a conversion of four existing companies into one concern running into about one million and a quarter sterling. Probably this fact has emphasised the inequity of the present system, and opinion is becoming quite definite about it. *The Times*, for example, has a pointed and appropriate "City Note" on the subject. "Opinion," it states, "has long held the view that industrial evolution is held seriously in check by the incidence of the stamp duties, which impose a heavy burden in cases of reconstruction and amalgamation. The Company Law Amendment Committee were downright in their view that where the shareholders in the old and the new companies are substantially the same there is no justification for charging an *ad valorem* duty on so much of the capital of the new company as represents the capital of the old company on which duty has already been paid. The effect, they rightly added, is double taxation, which places a heavy and unjustifiable burden upon industry and seriously interferes with the beneficial progress of reconstruction. The committee recommended that in both reconstruction and amalgamation cases where at least 90 per cent. of the capital of the new company is held by shareholders in the old company or companies no *ad valorem* stamp duty should be charged except on new capital. We would go farther, and say that when capital has paid the duty once it should not be called upon to pay again, regardless of whether the capital has changed hands or not. Under the Mining Industry Act that was passed last year exemption from stamp duties on capital was granted in the case of amalgamations of collieries, and there will be disappointment if this wise provision is not extended to industry in general. Great changes are necessary in the organisation of industry; such are contemplated in some of the country's most important industries; and they will be facilitated by removing the injustice of compelling capital to pay stamp duty every time a technical and economically advantageous reorganisation is necessary."

The B.D.C. Annual Meeting

It is not quite clear whether the British Dyestuffs Corporation's general meeting last week is to be the last of such meetings, since 98 per cent. of the shareholders have already exchanged into Imperial Chemical Industries—whether the operations of all the constituent bodies are in future to be reviewed at the annual meeting of the combine or to be still treated in some separate form. But if it should prove to be the last, Lord Ashfield's address makes a not unsatisfactory closing chapter. Without flattery, he thinks that the Corporation may claim that to-day they offer, in their technical and commercial departments, a service to the consumers of dyestuffs in textile and other industries that leaves little or nothing to be desired. Equally justified, we think, is his satisfaction that the recent progress of the Corporation was such as to secure its inclusion in so great a chemical amalgamation as Imperial Chemical Industries. The Corporation was formed in 1919, only some eight years ago, with the idea of founding a synthetic dyestuffs industry. It met with a series of difficulties of no ordinary character. To-day its position is such that no one would have dared to think possible at its birth. Lord Ashfield is making no extravagant claim when he states: "It is no small scientific and commercial achievement that, in spite of the handicaps under which the corporation has laboured, it has been able to develop from a small foundation a highly-organised dyestuffs industry capable of giving an effective service to the colour users of this country. We are, I think, to be congratulated that our fortunes are now indissolubly bound up, not with one particular section of the chemical industry, but with that of a gigantic industry working as a single unit and covering the whole field of chemical activity." The Corporation, in short, may now be safely regarded as having arrived in port, after a voyage of difficulties and dangers that called for captaincy of unusual courage, judgment, and persistence.

The Budget

THE Budget is as good as could be expected, although it fails to recognise the financial difficulties of the nation quite as a business man sees them. If any reader of THE CHEMICAL AGE were to reckon next year's sales as this year's profits, and were to spend the proceeds, he would be rightly relegated to the bankruptcy court. Yet Mr. Churchill is able to collect 15 millions of Schedule A and five millions of beer money upon which we ought to rely for next year, and in this way balance twenty millions of the extravagance of the year before, and to get credit for his ingenuity. Such is public finance. Apart from business criticisms of this kind, the Budget will be received with general relief, in that it leaves us, on the whole, no worse off than we were before. There is a beginning, although a small one, in the matter of economy, and the Ministry of Transport, the Mines Department, and the Department of Overseas Trade are abolished. The first has been abolished on several previous occasions. The unhappy history of coal mining since the Mines Department started seems to show that its closing will not be a national loss, while the cessation of the activities of the Department of Overseas Trade—a Department

from which we have received every assistance and courtesy—may result in a revival of energy by traders themselves in overseas markets.

The ugly features of the Budget statement, not emphasised by Mr. Churchill, are the inability of the State to collect the Income Tax, and the new phenomenon of a loss on National Savings Certificates. For the first time, more of the latter have been cashed than have been purchased. Business men will learn more about the Budget in the months that are to come, for we are promised further alterations in the methods of assessment. That Schedule E should be assessed on the year that has passed instead of the year that is to come is undoubtedly good, and a single Return for Income Tax and Super Tax will be welcomed. But, as the Chancellor said, the details of these schemes "will be set forth in the clauses of the Finance Bill in language which, I may say with safety, very few people will understand." The House of Commons laughed, but there will be little laughter at the innumerable interviews between taxpayers and accountants and officials which will occupy the thoughts of the business classes between now and next April. The public will now take its Easter holiday and forget national finance until the next Budget is due, but the rest of us will be failing in our duty unless we each do our share in developing a greater interest in economy.

Books Received

- THE ART AND PRINCIPLES OF CHEMISTRY. By Henry E. Armstrong. London: Ernest Benn, Ltd. Pp. 276. 15s.
REPORT ON THE ECONOMIC SITUATION IN BELGIUM IN 1926. By J. Picton Bagge, Department of Overseas Trade. London: H. M. Stationery Office. Pp. 176. 4s. 6d.

The Calendar

Apr. 22	Faraday Society: General Discussion on "The Theory of Strong Electrolytes."	Sir Leoline Jenkyns' Laboratory, Jesus College, Oxford.
23		
25	Chemical Engineering Group: "Permanent Moulding Machines for Cast Iron." Professor J. W. Hinchley. 8 p.m.	American Film Co., Ltd., 89-91, Wardour Street, London, W.1.
26	Royal Photographic Society (Scientific and Technical Group): 7 p.m.	35, Russell Square, London, W.C.1.
27	Society of Glass Technology: Annual General Meeting.	Sheffield.
27	Institute of Chemistry (Belfast Section): Visit to Belfast Electric Power Station. 7.30 p.m.	Belfast.
28	Institute of Metals (London Section): Annual General Meeting. 7.30 p.m.	83, Pall Mall, London, S.W.1.
29	Institute of Metals (Swansea Section): Annual General Meeting. 7.15 p.m.	University College, Singleton Park, Swansea.
30	North of England Institute of Mining and Mechanical Engineers. 3 p.m.	Lecture Theatre of Mining Institute, Neville Hall, Newcastle-upon-Tyne.
May 2	Society of Chemical Industry (London Section). 8 p.m.	Burlington House, Piccadilly, London.
4	Society of Public Analysts. 8 p.m.	Burlington House, Piccadilly, London.
5	Chemical Society. 8 p.m.	Burlington House, Piccadilly, London.
10	Institution of Petroleum Technologists: General Meeting. 5.30 p.m.	House of the Royal Society of Arts, Adelphi, London.
11	Institute of Metals: "The Growth of Crystals in Supersaturated Liquids." Sir Henry A. Miers. 8 p.m.	Institution of Mechanical Engineers, Storey's Gate, Westminster, London.

"The Institute and the Chemist"

To the Editor of THE CHEMICAL AGE.

SIR,—I have read with great interest the letter headed "The Position of the Chemist," and signed "Colorimeter," which appeared in your issue of April 9. Your correspondent states that the Institute "is not easily open to all chemists, particularly those chemists who graduated without high honours, or possibly have won a position or practice without a degree, and who after a lapse of years do not feel justified in re-starting the examinations necessary to them for the Associateship."

The above seems to indicate that your correspondent is not fully conversant with recent modifications in the regulations of the Institute, designed specifically to meet such cases as he describes.

I shall be very pleased to forward a copy of the regulations to any of your readers who may be interested in the matter.—Yours, etc.,

Institute of Chemistry.

R. LESLIE COLLETT,

Assistant Secretary.

April 9.

"The Position of the Chemist"

To the Editor of THE CHEMICAL AGE.

SIR,—My attention has been drawn to the communication of "Colorimeter" in your issue of April 9.

The British Association of Chemists has before it a long and difficult journey, and it has much to learn; but it does claim to understand something regarding the problems of organisation, and indeed to know more of them than any other chemical society or individual chemist.

Your correspondent appears to have studied the policy of the Association from afar off, and in such cases we suggest that a more intimate knowledge of it can be obtained from within than from without, since well informed criticism has been most valuable to the Association in the past, and will greatly assist it in the future.

It is necessary to point out that no such organisation as the National Union of Chemical Workers exists, and although it seems obvious that the National Drug and Chemical Union is intended, no sort of unification between the two societies is at present possible or even desirable.

Your correspondent does not completely understand the policy of the Association, which is concerned with a far-reaching organisation of the profession of chemistry, with the restriction of the practice of chemistry to properly qualified persons. Attainment of this end will bring with it, as a necessary but indirect consequence, economic advancement, but no one who knows anything of the Association's policy supposes that an economic policy is the only plank in its platform. It is true that your correspondent does not say that it is, but that he thinks so is strongly implied.

What is the aim of this organisation? Obviously that chemistry, like medicine, may become a public matter; that the public may demand that a high standard of qualification is maintained; that the public may insist that the chemist receives adequate financial award. Again, organisation is not a purely selfish affair; it must be of that type which seeks to advance the health and wealth of the community; that takes thought not only of direct financial advancement, but of the community's honour and dignity, and its own.

It is desirable but quite easy to insist upon the necessity for unity; but "federation," "unification," "affiliation," and the very word unity itself are mere empty phrases if a real desire for unity is lacking. There is, however, some evidence that it exists, and that evidence resides in the continued existence of the Association. The extraordinary success of the Association's Unemployment Benefit Fund rests upon the principle that a large number of chemists in little danger of unemployment themselves subscribe, alike with those in less secure positions, to assist their colleagues who are temporarily unemployed. That is the type of unity not easily to be broken, the only type of foundation upon which a structure, more of utility, can be built. Outside our ranks are many others moved by the same spirit. Membership of the Association gives that spirit a practical opportunity.—I am, etc.

HY. T. F. RHODES,

British Association of Chemists, General Secretary.

Empire House, 175, Piccadilly, W.1.

April 12.

Jets and Jetonised Material

At a meeting of the Institution of Petroleum Technologists, held at the Royal Society of Arts, London, on Tuesday, Mr. E. H. Cunningham Craig read a paper on "Jets and Jetonised Material." This investigation was a continuation of, and supplementary to, the writer's former papers upon oil shales, torbanites, and cannel coals. The subject was approached from the practical side—i.e., regarding these deposits as retortable material from which oil could be obtained in commercial quantity. The first material to be examined was naturally the type material, jet. Results of the treatment of jet in the Struben still, and also of the examination and testing of canneloid and lignitic deposits, were given. Summing up, the author said that it was evident that jetonised material represented an intermediate stage between wood or other vegetable matter and coal, and also an intermediate stage between vegetable matter and petroleum. It was not a very definite stage, since the changes it underwent were progressive. The range shown by coals, from lignite to anthracite, was, of course, very much greater. In considering raw material for retorting purposes, whether it be coal, cannel or lignite, the proportion of jetonised material, and the stage it had reached, must be noted. While the gels of a torbanite, if fresh, would yield anything up to 180 gallons per ton—the theoretical yield was even greater—jetonised material could be counted on for 40 or 50 gallons per ton.

Chemical Research Appointment

BOOTS PURE DRUG CO., LTD., have decided to extend the scope of their research work at Nottingham, and for this purpose new laboratories are being equipped, whilst their staff of research chemists is about to be increased. They have appointed as head of the research laboratories Dr. F. L. Pyman, F.R.S., Professor of Technological Chemistry in the University of Manchester and in the College of Technology. A primary object of this new development is the prosecution of fundamental research in the domain of chemotherapy, and Professor Pyman's high qualifications and scientific record are a sufficient guarantee that a high standard will be maintained. His better known investigations are concerned with the chemistry of the alkaloids and of synthetic compounds closely related to them; recently he has devoted much attention to the glyoxaline group, and has effected a brilliant synthesis of one of the most important members of the series—namely, histidine, a structural unit of some protein molecules.

Transport Adviser to I.C.I.

MEMBERS of the North Staffordshire Chamber of Commerce have learned with regret that Mr. Edward Hoyle has been compelled to advise the President (Sir Francis Joseph) of his resignation from the office of Chairman of the Transport Committee, owing to his having been appointed chief transport adviser to Imperial Chemical Industries, Ltd. Mr. Hoyle has been for many years in charge of the transport problems of Brunner, Mond and Co. During his association with the North Staffordshire Chamber of Commerce, he has directed the work of the Transport Committee with great ability. His exceptional knowledge of railway rates, together with a facility for stating intricate traffic matters in simple language, has been a great advantage to the members of the Chamber and to the traders of North Staffordshire as a whole. In the monthly bulletin of the Chamber Mr. Hoyle is cordially congratulated on his appointment.

Chemical Trade Returns for March

THE Board of Trade returns for March indicate that imports of chemicals, drugs, dyes and colours during the month amounted to £1,660,625, an increase of £203,686 as compared with March, 1926; exports amounted to £2,136,617, a decrease of £169,212 as compared with March, 1926; re-exports of imported goods amounted to £67,876, a decrease of £38,279. For the three months ended March, 1927, imports amounted to £4,336,593, an increase of £556,403 on the corresponding period in 1926; exports amounted to £5,461,728, a decrease of £717,801; while re-exports of imported merchandise amounted to £207,589, a decrease of £98,134. A detailed account of the separate items of the returns will be given in next week's issue of THE CHEMICAL AGE.

The Dust Hazard in Industry

A Review of the Situation

The occurrence of dust in various industries, the dangers resulting therefrom, and their investigation and elimination, are discussed at length by Dr. W. E. Gibbs in his book "The Dust Hazard in Industry," published by Ernest Benn, Ltd.

By permission of the publishers we are enabled to reprint below some extracts from the book.

ALL too often, dust has been looked upon as a necessary evil. The grime and smoke of a manufacturing town were regarded with pride as the unmistakable evidence of industrial prosperity. The workers in certain dusty occupations continually inhaled the dusty air, and slowly choked to death. The miller wore a white hat and, every now and then, his mill was blown sky-high.

Generally speaking, it is through ignorance or indifference that dust is allowed to become a nuisance and a danger. In the past, ignorance was general, and the workers suffered; to-day, however, ignorance is less excusable, and, in many cases, there need be neither dust nuisance nor dust hazard. A great deal of the dust and smoke nuisance that exists in our towns and industrial centres is due to the apathy of the general public, and the resulting lack of an organised public opinion. The continued existence of a dust hazard is frequently due to a degree of indifference on the part of the responsible employer or workman that amounts to culpable negligence. In this little book we are not concerned with the dust and smoke nuisance; this aspect of the question merits separate treatment. Here we are concerned, first, with the danger to health that arises when certain dusts are inhaled or handled by the workers, and, secondly, with the danger to life and property that is associated with the explosion of a cloud of inflammable dust.

Dusty Air

It has been shown that the normal dust content of the atmosphere is less than 1 mgm. per cubic metre in country districts and over the sea, between 1 and 3 mgms. in a town, and as much as 5 mgms. in an industrial centre. Naturally, the amount is greater in dry weather. The composition of the dust also varies according to the locality. Over the sea the dust consists almost entirely of salt particles that are formed by the evaporation of spray. In a country district, pollen or soil particles will predominate, according to the season and the weather, while smoke particles from a distant manufacturing town or salt dust from the sea will be found when the wind blows from those quarters. Street dust contains soot and flue dust, mineral dust from street paving and buildings, organic matter from garbage and decaying leaves, dust worn off boots and clothes, manure of horses, dung of dogs, fragments of insects and their eggs, mould spores, plant pollen, bacteria.

In many industries the normal dustiness of the air is greatly increased by dust that is produced in the course of the manufacturing operations. Generally, it is produced as a direct result of some disintegration process. Among the most dusty trades are the grinding and polishing of metals, the milling of starch, cereals and nuts, the crushing and grinding of rocks, minerals, and many inorganic and organic substances, the manufacture and working of textiles, the drilling and blasting of rocks in mines and quarries, the working of builder's stone, glass, leather, cork, graphite, etc. The atmosphere in which these operations are performed may contain up to 30 mgms., and, in some instances, as much as 400 mgms. of dust per cubic metre of air. In Table I are shown (a) the average quantities of dust in milligrams per cubic metre that are commonly present in the air in certain working environments, and (b) the average number of dust particles per cubic centimetre of the air.

In town air and in many badly ventilated workshops in which open fires are used the majority of the particles are black smoke particles. These are found to be singularly uniform in size, ranging from 0.25 to 1 μ , and averaging about 0.5 μ . The extremely fine character of the dust that is produced in such occupations as iron-grinding and gold-mining is reflected in the relatively high number of particles per cubic centimetre. The apparent dustiness of the air in a factory or workroom depends very much upon the colour of the dust and the size and shape of the particles. The atmosphere in an old-fashioned flour mill, or in a rag-sorting

TABLE I (a).

Locality.	Mgms. dust per cubic metre air.	Remarks. (1 μ = 0.001 cm.).
Garden, Edgbaston, after 4 days' fine weather.	0.28	
Same, after 36 hours' heavy rain.	0.07	
Open air, Stoke (manufacturing district).	0.94	
Centre of laboratory, Stoke.	1.85	
Polishing room (floor unswept).	5.4	
Same, with floor swept.	1.6	
Grinding table blades.	22.0	Small room, badly ventilated. Quartz particles, 5 μ -10 μ .
" " "	2.5	Large room, good ventilation. Wheels entirely enclosed. Quartz particles mostly 20 μ .
Racing sandstone.	309.5	Exhaust useless. Practically all angular particles, about 40 μ .
" " "	25.3	Good exhaust hood.
Rumbling castings.	210.6	60% angular particles, of up to 3 μ .
Stripping large casting (steel, by hand).	91.6	6 men with hammer and chisel, 30 strokes per minute. Particles angular up to 20 μ .
Marble-cutting shop.	19-24	Sharp marble fragments.
Rag-sorting shop.	33-79	Textile fluff and dust.
Felt shoe factory.	175	
Cement mill.	130	Mill not working.
" " "	224	Mill working.
Gold-mining.	188-412	Drilling quartz rock.

TABLE I (b).

Locality.	Number of particles per c.c.	Remarks.
Bridlington pier (5 p.m., April).	0	Gentle wind from E.N.E. Sunny and cloudless. Visibility perfect. No salt crystals and no smoke particles even in 3000 c.c. air.
Middle, Bay of Biscay (2.30 p.m., April).	15	Salt crystals up to 13 μ \times 0.9 μ . Wind N.N.E. Visibility good.
Cheam, Surrey (8.40 a.m., July).	920	Little or no wind. Marked haze.
Westminster (May).	1,390	Ordinary non-foggy day.
Westminster (10 a.m., Feb.).	20,800	Moderate smoke fog. Buildings invisible against sky at 1,600 ft.
Westminster (2 p.m., Jan.).	21,760	Dense fog. Many brownish, tarry particles 1.7 μ diameter.
Westminster (11.15 a.m., Jan.).	53,000	Very dense fog, limiting visibility, 30-40 yds.
Wet sandstone grinding shop (stove grates).	496	34% particles greater than 2 μ . Much scale as opaque, black particles 2 μ -10 μ .
Wet sandstone-grinding shop (scythes).	3,000-3,500	Clear, translucent, yellow sand particles, from 3 to 7% over 2 μ .
Wet sandstone-grinding shop (textile machinery large parts).	5,926	Sandstone particles of all sizes up to 10 μ .
Rumbling castings (house partly open).	3,301	31% are greater than 2 μ .
Dry emery wheel grinding castings.	2,687	20% are greater than 2 μ .
Racing grindstones (to dress surface).	3,000-12,000	Up to 28% particles are coarser than 2 μ . Many particles up to 10 μ & 15 μ .
Gold or tin mining (drilling quartz rock).	10,000-12,000	Fine quartz dust.

room, appears to be far dustier than that in an iron-grinding room, particularly when viewed against a dark background, because the lighter-coloured particles reflect more light and show up in more strongly marked contrast against the relatively dark detail beyond. Such dusty atmospheres provide a very undesirable environment for the workers. The unhealthy character of such dusty occupations as pottery manufacture (flint dust), stone dressing (sandstone and millstone grit), the grinding of iron and steel, the drilling of quartz rock in gold and tin mines, has been recognised for centuries. In the pottery industry the danger was understood and, generations ago, was avoided by the introduction of the wet-grinding of flint.

Introduction of Legislation

Towards the end of the nineteenth century, public opinion in this country was aroused by the seriousness of a number of cases of lead poisoning amongst workers engaged in the manufacture of white lead and in the glazing of pottery, and of "phossy jaw" amongst makers of lucifer matches. Between 1878 and 1895 legislation was introduced to protect the workers in certain specified industries from the incidence of such occupational diseases. Special rules were introduced into the Factory Acts to give control over dangerous occupations, with the object of obtaining early knowledge of such occupational diseases as poisoning by lead, arsenic, phosphorus, and mercury. The obligation of notifying these diseases was placed upon medical practitioners. In the Workmen's Compensation Act of 1906, twenty-five occupational diseases were scheduled, to which the provisions of the Act applied. Of recent years a large amount of valuable research work has been carried out by the Home Office and by the Ministry of Health, with the object of minimising and, where possible, eliminating this dust hazard in industry. In many industries steps have been taken to prevent the escape of dust from the work—as, for instance, by keeping the work wet, or by surrounding the machine with a suction hood that removes the dust as it forms. Where these remedies are impracticable, respirators have been introduced, and an increased personal cleanliness has been encouraged. In some industries an important change has been introduced into the process itself, whereby a harmless dust is substituted for a dangerous one. The prevalence of lead poisoning in the pottery industry, owing to the inhalation of plumbiferous fume and dust arising from the use of a lead carbonate glaze, has been greatly diminished by the substitution of a lead silicate glaze that is insoluble in the gastric juice. In many cases a great deal can be done to reduce the danger by the education of the workers themselves. This is nearly always necessary, for, even when special protective devices are introduced, they are of no use unless they are properly utilised and maintained.

Need for Further Investigation

Although so much has been done to minimise the danger to health by the introduction of suitable methods of dust prevention, there still remain occupations in which the use of such remedies are difficult to apply, either on account of the arrangement of the work or because of their effect upon the cost of the product. In industries in which general preventive measures cannot be employed it is necessary to carry out a careful and thorough scientific investigation into the effect of the normal dust output upon the health and physical condition of the worker. From the information that is obtained in this way, it will, in most cases, be possible to devise a remedy for the disease—particularly if it can be taken in its early stages. A periodic examination of the workers enables any diseased condition to be detected before it has proceeded too far to be remedied.

Similarly, the risk of dust explosions has been greatly lessened during recent years by the introduction of preventive measures that are based upon the results of a systematic scientific investigation of the principles underlying the ignition and combustion of different dusts. In factories and mills that were once notoriously dusty there is a growing tendency to prevent the escape of dust by using enclosed machinery. In a modern flour mill dust is conspicuous by its absence. The introduction of electric lighting has greatly reduced the chance of ignition by an open flame. In many cases inflammable materials are ground and conveyed in an inert atmosphere. If an explosion or fire does occur at a point

in the system, it is prevented from spreading by the employment of ingenious dust gates and barriers, and revolving dampers, or the flame is quenched by the automatic release of inert dust. Provided that certain simple precautions are taken, it is now almost impossible for a dust explosion in a coal mine to travel more than a few yards from its point of origin.

Society of Public Analysts

An ordinary meeting of the Society was held at the Chemical Society's rooms, Burlington House, London, on Wednesday, April 6, Mr. John White (vice-president) in the chair.

Certificates were read for the first time in favour of F. C. Bullock, B.Sc., A.I.C., T. H. Fairbrother, M.Sc., F.I.C., R. S. Rack, and S. G. Sherman; for the second time in favour of A. G. J. Lipscombe, B.Sc., A.I.C., W. L. Matthews, S. J. Rogers, B.Sc., F.I.C., E. F. Waterhouse, H. W. Webb, and A. S. Wood, M.Sc., Ph.D., F.I.C.

The following were elected members: W. G. Carey, F.I.C., W. F. Elvidge, B.Sc., A.I.C., L. S. Fraser, B.Sc., A.R.C.Sc., A.I.C., F. P. Hornby, B.Sc., A.I.C., G. R. Lynch, M.B., B.S., D.P.H., E. C. Martin, and G. G. Philip.

Abstracts of Papers

In a paper on "The Sequence of strokes in writing," by C. A. Mitchell, M.A., F.I.C., and T. J. Ward, it was pointed out that systematic experiments had been made to determine to what extent one may trust to the appearance of one of two intersecting lines being uppermost as a proof that one was made more recently than the other. It was shown that the appearance coincided with the fact in the case of insoluble opaque pigments such as lead pencil, but was deceptive when a transparent pigment such as an aniline dye was in question. The relative position of lines made with writing inks which underwent oxidation, and thus formed an opaque insoluble pigment, could usually be accurately determined, but if the ink had been blotted the observation was, as a rule, untrustworthy.

Observations on the "Washing of gluten from flour" were presented by D. W. Kent-Jones, Ph.D., B.Sc., F.I.C., and C. W. Herd, B.Sc., F.I.C. It was shown that the use of a special washing solution, such as that suggested by Dill and Alsberg, did not eliminate the errors inherent in gluten determinations. Even when the same amount of washing water was used and the same procedure followed, personal differences in the manipulation of the dough and gluten caused large variations in the result. It had been found, however, that each operator got essentially consistent results, which meant that the ratio between the nitrogen of the flour and the dried gluten was approximately constant for each worker.

Another paper by the same authors dealt with "A numerical expression for the colour of flour." The colour, it was stated, might be expressed by the tints given to two distinct solvents. The yellow colouring matter was extracted by means of petroleum spirit, and its colour was measured in a special form of colorimeter. This figure indicated the natural whiteness, or alternatively, the artificial bleaching of the flour. The grade of the flour might be judged by the amount of the reddish-brown pigment present which, presumably, came from the finely powdered offal present. This pigment was determined in the colorimeter after extraction with alkaline methyl alcohol.

H. B. Dunncliff, M.A., Sc.D., F.I.C., and Kishen Lal, M.Sc., in a paper on "The determination of free mercury in commercial products," pointed out that the main constituents of the substance containing free mercury were removed by extraction with a suitable solvent. The residue was treated with bromine water, the resulting mercuric bromide was dissolved in alcohol, and the mercury was precipitated as mercuric sulphide, which was filtered off and weighed in a Gooch crucible. The method was shown to give accurate results with various commercial products, such as mercury ointment, grey powder, and mercury fulminate.

THE ROYAL PHOTOGRAPHIC SOCIETY'S scientific and technical group, at a meeting at 35, Russell Square, London, on April 26, will deal with the following papers: "Thiocarbamide as an Impurity in Thiocyanates," by T. Slater Price, F.R.S., and J. W. Glassett; "A Contribution to the Theory and Practice of the Carbo Process," by C. Lighton; and a "Note on the Performance of the B.P.R.A. Photo-Electric Density Meter," by J. O. C. Vick.

The Yellowing of Drying Oils

Oil and Colour Chemists' Meeting

At a meeting of the Oil and Colour Chemists' Association, held in the rooms of the National Federation of Paint, Colour and Varnish Manufacturers, St. Martin's Place, London, on Thursday, April 7, a paper by Dr. R. S. Morrell (past president of the Association) and Mr. S. Marks, on "The Yellowing of Drying Oil Films," was read. During the last year, said Dr. Morrell, Mr. Marks and himself had been investigating the yellowing of white paints with drying oils when kept in the dark, and it had been found advisable to review the changes occurring during the oxidation of drying oil films, in order to decide, if possible, which component of the oxidation products was producing the changes in colour.

Materials Investigated

A number of paint films were prepared with white lead (stack), zinc white, titanium white, timonox, arsenious oxide, and tin dioxide. The changes in colour of the films, which were kept in the dark in a moist atmosphere at the ordinary temperature, were observed, using yellow and red Lovibond's tintometer glasses. The paint films were compared against a film of zinc white and Reeve's poppy seed oil as standard. The amount of oil mixed with the pigment was as small as possible, and any increase in the amount was accompanied by greater changes in colour. From the results obtained in the white lead experiments, there seemed to be an indication of a maximum yellowing and reddening in six months, and afterwards a diminution, but longer trials were necessary in order to decide this. The influence of the nature of the oil used agreed with the results of earlier investigators, and the oils could be placed in the following order of increasing yellowness: poppy, walnut, specially bleached special linseed oil (supplied by Professor Laurie), and five varieties of raw bleached linseed oil prepared by one of the authors.

The rate of change of a white lead raw linseed oil film was much slower than with treated linseed oils; the original film was yellower at first, and a very thin film was formed. The same effect was observed with China wood oil, but the film was originally of a darker colour. The addition of linseed oil acids, as well as oleic acid and benzoic acids, accelerated the yellowing. Oleic acid with raw linseed oil paint was more discoloured than linseed oil alone when white lead was used as pigment.

Zinc white paints gave results, as regards colour changes, much less striking than in the case of those with white lead; while in the case of titanium white the colour changes in the oils were generally even less. With arsenious oxide, after six months' exposure, all the oils, with the exception of poppy oil, showed decided yellowing.

The Authors' Conclusions

On the whole, the authors' paint trials confirmed the results of previous investigators, but the forecast of Eibner, that there was little prospect of overcoming the difficulty, was too pessimistic. The behaviour of stand oil was of interest in comparison with other drying oils, and the proposal to use it as a medium in the presence of petroleum thinners was worthy of consideration. The addition of dammar in turpentine as a preventive had been recognised in the craft for a long time, especially in oil varnishes on white work, and an increase in the resin content of a varnish invariably reduced the tendency of the film to become discoloured by diminishing the permeability to moisture, but was often conducive to loss in lustre. The effect of manganese must now be withdrawn as a cause of the yellowing. With regard to the influence of the pigment on the discoloration, it appeared that anhydrous titanium oxide produced least yellowing with most of the drying oils tested.

The chemical aspects of the changes occurring during and subsequent to the drying of oil films were then discussed at length. From the results obtained up to the present, the property of yellowing in the dark was shown to be connected with the presence of a grouping derived from a peroxide, which grouping was contiguous to the carboxyl end of the molecule. The presence of the grouping would depend on circumstances, and on the general configuration of the drying oil molecule. The basic or acidic nature of the pigment was not the deciding factor, but traces of water, or the elements of water, in a

pigment, were especially active in favouring the arrangement indicated. The use of inactive anhydrous pigments to prevent the yellowing of the oxidised film was to be specially recommended. These conclusions had been suggested by earlier workers, and their validity required still further investigation of the oxidised glycerides.

From the results obtained with the β -eleostearic glyceride, there were strong indications that the changes in the molecule might be controlled, because of the comparative simplicity of composition of the oxidised substance and freedom from other glycerides. Any subsequent polymerisation effects of the oxidised substance could not be neglected, because there was evidence of their presence in the oxidised acids obtained from the α -eleostearic acid.

British Association of Chemists Foreign Chemists in England

It is to be hoped that the fiction that the German chemist is in every way superior in training and ability to his English colleague is now quite dead. It is certain, and has been certain for a very long time, that the English chemist, given the opportunity to show his worth, is the equal of any chemist trained in any other country. At the same time, it is true that where special processes patented abroad have emigrated to this country it may in some circumstances be necessary to employ for a certain length of time foreign chemists to control plant of which they may have been the part inventors, and in the operation of which they claim to be experts.

This, at any rate, is the view of the Home Office, with whom the British Association of Chemists has been in communication concerning this question. The Association was then dealing with a specific instance of the employment of an alien chemist, and the case was presented by the Home Office in this way. In cases where a firm was successfully working a process the continued success of which would be endangered if the alien control of it were withdrawn, it was stated definitely that alien control must be retained, since otherwise, by the dismissal of one many would be thrown out of employment. At the same time the Home Office guaranteed that such alien employment was only to be permitted on the express understanding that the foreign expert was training English chemists in the special work.

With this position, which appears quite reasonable, the Association expressed itself satisfied, while realising that a careful watch must be kept on the situation. During the last three months the Association has been credibly informed that in a certain branch of industry a number of foreign chemists are employed under conditions which compare too favourably with those of the English chemists. It appears evident that the regulations of the Home Office, quite sound and even necessary in theory, are capable of being interpreted in a number of ways, and it seems necessary that the situation should continue to be carefully examined.

The Association is investigating the question and will again take the matter up if confirmatory evidence is obtained. Sufficient has been said to show that the matter is complicated by a number of factors which have all to be taken into consideration. The saving of the principle by the appointment of an English chemist in place of a foreign chemist at the cost of the closing down of an undertaking employing perhaps hundreds of hands would be nothing better than a victory for the worst type of professional insularity. It is the duty of a professional organisation to take the long view despite the peculiar difficulties and pitfalls to be found in that direction.

H. T. F. R.

Anglo-Italian Conference

AMONG the questions discussed at the meeting, on Thursday and Friday, April 7 and 8, between representatives of the General Fascist Confederation of Italian Industries and of the Federation of British Industries, was that of fairs and exhibitions. The conference recorded its opinion that the increasing number of fairs and exhibitions was a matter of grave inconvenience to manufacturers who were solicited to participate therein, and that the International Committee appointed for the purpose should be asked to study the matter with a view to limiting the number of fairs and exhibitions of an international character to one in each country.

Coking By-Products Production

Preliminary Report on By-Product Production, 1924

THE Third Census of Production, 1924, is now approaching completion, and the *Board of Trade Journal* for March 17 contains some notes on the data obtained as regards the coke and by-products trades, from which the following details are abstracted. Large quantities of coal tar products are produced by gas undertakings and by firms engaged in the distillation of coal tar, and the output given should not, it is stated, be regarded as approximating closely to the final aggregate, since figures given deal with the output from companies operating coke ovens at or in connection with coal mines, and manufacturers by whom coke is made mainly as a material for use in their other productive departments.

In 1907 the value of the by-products represented only 7 per cent. of the gross output of coke ovens; in 1912 they represented 18 per cent., and in 1924, as shown in the table below, 31 per cent. of the gross output. In 1907 a ton of foundry coke had an average sale value at the works of 16s. 9d., and the by-products obtained per ton of coke were worth, on the average, 1s. 3d., making a total of 18s. In 1924 a ton of foundry coke had an average value of 26s. 4d., and the by-products obtained per ton of coke were worth 11s. 9d., making a total of 38s. 1d., or an increase of 111½ per cent.

In the report on the first Census the tar produced for sale amounted in weight to three-fifths of 1 per cent. of the coal carbonised; in 1912 it amounted to about 1½ per cent., and in 1924 it was over 2½ per cent. of the corresponding weight. The value per ton of the tar sold in 1924 was nearly 3½ times that shown by the 1907 records. While the sale of tar in 1907 added little more than 1 per cent. to the proceeds of the sale of coke, in 1924 the addition was 8½ per cent.

Ammonium Sulphate and Benzol

From the point of view of sale value, sulphate of ammonia was the most important of the by-products both in 1907 and in 1924. In the former year it added 4·4 per cent. to the value realised from the coke made; in 1924 the addition was 13·4 per cent. The weight of sulphate of ammonia produced was, in 1907, about one-fifth of 1 per cent. of the weight of all the coal used; in 1924 it was 1 per cent. of the weight of the coal. The value per ton recorded for sulphate of ammonia disposed of by coke works in 1907 was about £11 5s. and in 1924 about £12 4s. In order of importance benzol ranks next to sulphate of ammonia, and the output reported at coke ovens in 1907 was little more than one-eighth of a gallon per ton of coal carbonised. In 1912 the average yield was four times that of 1907, and in 1924 the average was about 2 gallons per ton of coal, or between four and five times that of 1912. The average value was 5d. per gallon in 1907 and 1s. per gallon in 1924.

The output of tar oil, creosote and other heavy tar oils in 1907 was about 5 gallons per 100 tons of coal carbonised; in 1912 it was not far from four times this amount, and in 1924 it was about 90 gallons per 100 tons of coal. In 1907 the average value of these oils was under 3d. per gallon, and in 1924 about 7d. per gallon. With a somewhat smaller amount of coal carbonised in 1924 than in 1907 the pitch recovered was thirty times as much, and the value of 24s. per ton in 1907 is replaced by an average value of 56s. per ton in 1924.

Increased Recovery of By-Products

In contrasting the yield of coke and of the leading by-products of coal distillation in 1924 with that obtained in 1907 the possible differences in the average quality of the coal carbonised must not be ignored. It is obvious, however, that the main feature calling for attention is the alteration in practice, indicated both by the difference in the type of oven used and by the greater recovery of products which were mainly wasted in 1907. The comparison of the exports and imports of the by-products of coal distillation with the quantities made in 1924 cannot be made until the output of gasworks and of other works at which the products derived from coal are handled can be taken into account.

In regard to sulphate of ammonia, anthracene, benzol, carbolic acid, naphtha and naphthalene, and toluol, owing to the fact that the returns were made on the bases of different standards (no standards being given in some instances), the quantities of these products should be regarded merely as a rough approximation.

The following figures for production are given:

Products.	Quantity.	Value.
Coke	12,803,000 tons	16,859,000
Tar	500,000 tons	1,430,000
<i>By-Products:—</i>		
Sulphate of Ammonia	185,000 tons	2,257,000
Anthracene	66,000 cwts.	23,000
Benzol	37,900,000 galls.	1,819,000
Carbolic Acid	28,000 cwts.	19,000
Naphtha	1,812,000 galls.	87,000
Naphthalene	191,000 cwts.	54,000
Pitch	151,000 tons	423,000
Tar Oil, Creosote Oil and other	17,132,000 galls.	507,000
Heavy Coal Tar Oils	1,669,000 cwts.	
Toluol	320,000 galls.	25,000
Other Distillation Products	29,000 cwts.	
Waste Heat (including Gas) sold	—	160,000
Electricity sold	—	465,000
All other Products	—	117,000
Total value of Output	—	144,000
		24,389,000

Chemical Matters in Parliament

River Pollution

Answering Lieut.-Col. Howard Bury (House of Commons, April 3), Mr. Chamberlain said that he hoped to give an early decision on the application of the Essex County Council for leave to take proceedings in reference to the alleged pollution of the River Chelmer by the Felstead sugar-beet factory. The company owning the factory had expressed their willingness to carry out the recommendations of an expert on the subject.

Experimental Lactose Factory, Haslington

Mr. Guinness, Minister of Agriculture (House of Commons, April 6), replying to Mr. Lansbury, stated that the total cost of the experimental factory at Haslington, which was established to investigate the problem of the utilisation of whey, was £43,600, including maintenance charges of £12,700 during the period 1918–26; it was sold by public tender for £3,000, as from March 1, 1926. The cost of the experiment to the Exchequer was therefore £40,600. An account of the work done at the factory, and of the solution which was obtained of the problem before it, was published by the Ministry in a monograph.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

41 (*Strontianite*).—"Would you kindly inform me of British firms interested in the purchase of strontianite (strontium carbonate)."

42 (*Silicate of Iron*).—"Will you please inform me where I can obtain a supply of silicate of iron in which the iron runs about 66 per cent."

43 (*"Kadox"*).—"We should be glad if you would kindly let us know who are the makers of a colloidal zinc oxide preparation under the trade mark 'Kadox.'"

Therapeutic Substances Regulations

REGULATIONS prescribing the condition under which licences will be issued for the manufacture or import of therapeutic substances scheduled in the Therapeutic Substances Act, 1925, have now been issued (states the Ministry of Health) and will come into operation on August 6 next. Standards of strength, quality, and purity, and containers and labels are dealt with in the regulations which have been framed after consultation with an advisory committee representing the principal medical and pharmaceutical associations in Great Britain.

From Week to Week

A SERIOUS FIRE occurred during last week end at the premises of Jacks and Co., edible fat manufacturers, of Sidegate and High Friar Lane, Newcastle.

MR. DUDLEY WRIGHT, in a paper read recently before the members of the Institution of Aeronautical Engineers, in London, discussed the possibility of using the aeroplane in the British Empire for the distribution of insecticides.

DR. E. A. HAUSER, of Frankfurt-on-Main, will deliver the Gow lectures on "The Colloid Chemistry of the Rubber Industry," at University College, London, on May 2, 4, 6, 9, 13, and 16. At the first lecture the chair will be taken by Professor F. G. Donnan, F.R.S.

AN ACETATE SILK AGREEMENT has been discussed in the German Press lately, and the names of British Celanese, Tubize, and Azeta G.m.b.H. have been mentioned. It appears that these reports are premature, and that so far only preliminary discussions have been held.

MR. JOHN PARKE JACKSON has been appointed by the directors of the Salt Union, Ltd., as an additional member of the board. Mr. Jackson has been connected with the Union for 27 years and occupies the positions of head of the coastwise and continental sales department and foreign representative.

AT THE BRITISH SCIENCE GUILD dinner to be held at the Criterion Restaurant, London, on Thursday, May 12, Lord Asquith will preside and the speakers and other guests will include: Sir Alfred Mond, M.P., Sir Herbert Samuel, General Sir George Milne, the Hon. W. Ormsby-Gore, M.P., Sir William Pope, Sir Frederick Keeble, and Prebendary Gough.

THE AMERICAN CHEMICAL SOCIETY announces the appointment of the following as committee of direction of the recently-founded American Institute of Chemistry: Professors G. L. Wendt, F. C. Whitmore; and Messrs. W. R. Whitney (General Electric Co.), C. A. M. Stine (E. I. du Pont de Nemours), C. E. K. Mees (Eastman Kodak Co.), and F. W. Willard (Western Electric Co.).

THE JOINT DYERS' EXECUTIVE, in regard to the dispute concerning the proposed withdrawal of the Mackenzie Award, have authorised the negotiating sub-committee again to enter into communication with the employers "for the purpose of settling the dispute without the matter being referred to arbitration." Full powers were given to the sub-committee to deal with the situation, and, in the words of the official statement, "provided details which have been suggested can be met by the employers, it appears a settlement will be effected."

THE FARADAY SOCIETY has now issued its programme of the general discussion on "The Theory of Strong Electrolytes," which is to be held at the Department of Biochemistry, Oxford, on April 22 and 23. Professor C. H. Desch will preside. The first day will be devoted to "Mobilities of Ions," ten papers on the subject being presented, while on the second day the discussion will be centred on "Activity," on which subject fourteen papers have been submitted. Among the foreign contributions are papers by Professors P. Debye, J. N. Brönsted, N. Bjerrum, K. Fajans, C. A. Kraus, and M. Randall.

THE BRITISH ACETYLENE AND WELDING ASSOCIATION held a meeting at the Old Colony Club, First Avenue Hotel, London, on Thursday, April 7. Mr. A. Jackson, managing director of Carbic, Ltd., presiding. A paper on "The use of oxy-acetylene welding in the heating trade generally," by Messrs. J. L. Musgrave and W. A. E. Taylor (both of Richard Crittall and Co., Ltd.), was read before the meeting. The authors expressed the view that if manufacturers could reduce the cost of gas they would reap the benefit of an enormously increased output, as the number of users would greatly increase.

SUGAR BEET NEWS.—The registration is announced of the Shropshire Beet Sugar Co., Ltd., of 87, Bishopsgate, London. The nominal capital is given as £373,500, in 332,000 preferred ordinary shares of £1 and a similar number of deferred ordinary shares of 2s. 6d.—The statutory meeting of the Lincolnshire Beet Sugar Co., Ltd., was held at Winchester House, London, on Monday. The chairman, Mr. F. R. H. Shortis, said that the factory which was being built for the handling of the next season's crop was advancing very rapidly. The board had arranged contracts with farmers for a total of 11,400 acres, made up of contracts of all sizes, with 2,780 growers. Seed to the amount of over 80 tons had been purchased and distributed to the growers working in association with the company. Further, each grower had been provided with cultural instructions, based upon advice received from the company's experts, and would continue to receive from the company's representatives advice and assistance.—Mr. G. Turville Brown read a paper at the Surveyors' Institution, London, on Monday, on "Beet Sugar." One of the questions discussed was whether the beet sugar industry would prosper when the subsidy had ceased. He quoted as the nearest parallel the experience of Holland, where for many years no protection of any kind had been given.

ARTIFICIAL SILK COMPANIES have been guaranteed altogether £85,000 under the Trade Facilities Act, according to a statement made by Mr. McNeill in the House of Commons.

MR. W. H. COATES (treasurer of Imperial Chemical Industries, Ltd.) will read a paper on "Some Observations on the Colwyn Report," at the Conference of the Chartered Institute of Secretaries, to be held on May 12 and 13, at Liverpool.

THE INSTITUTE OF CHEMISTRY has issued a reprint of the address given by Mr. A. Chaston Chapman, F.R.S., on "The Growth of the Profession of Chemistry During the Past Half-Century," which was delivered before the members of the Institute on March 11.

THE NATIONAL UNION OF DRUG AND CHEMICAL WORKERS, at its recent annual meeting in London, adopted a resolution calling for State inspection of all public and private dispensaries. Another resolution was passed advocating the complete nationalisation of the medical services.

MR. W. H. J. VERNON (Imperial College, Royal School of Mines) has had conferred upon him the D.Sc. (Engineering) degree of the University of London, for a thesis entitled "The Atmospheric Corrosion of Metals (Second Experimental Report to the Atmospheric Corrosion Research Committee)."

FOR THE YEAR ENDED DECEMBER 31, 1926, each one of the numerous London lorry and van drivers in the employ of Allen-Liversidge, Ltd., manufacturers of welding and lighting equipment, has been awarded the diploma of the London Safety First Council for having been free from accidents in the Greater London area.

APPLICATIONS ARE INVITED for the following appointments: A Ramsay Memorial Fellowship for Chemical Research, £250 plus £50 for expenses. The Secretary, Ramsay Memorial Fellowship Trust, University College, Gower Street, London. June 6.—Demonstrator (man or woman) in the Chemical Department of Bedford College for Women (University of London), Regent's Park, N.W.1. £250—£300. The Secretary, May 7.

RECENT WILLS INCLUDE: Mr. Herbert Edward Nicholls, of Woking and London, a director of the Anglo-Persian Oil Co., the Turkish Petroleum Co., the British Petroleum Co., the British Tanker Co., Scottish Oils, and a number of other oil and industrial concerns (net personalty £28,213) £33,030.—Mr. Robert Rowe Pearse, of Plymouth, lately managing director of the Burma Chemical Industries, Ltd., of Rangoon (net personalty £468), £1,015.

THE SODIUM SULPHATE REFINING CO., LTD., has been formed to develop valuable sodium sulphate deposits located near Fusilier on the Canadian Pacific Railway, west of Kerrobert, Saskatchewan. Sodium sulphate, or natural Glauber's salt, occurs extensively in certain lake beds of western Canada, and the development of these deposits has been lately attracting attention because of the wide use of the product in pulp and paper manufacture, glass, textile and dye industries, as well as for medical and tanning purposes.

THE MOOSE RIVER GYPSUM BEDS of Northern Ontario, which have been listed among the potential resources of the James' Bay slope since 1875, have had some development work, including diamond drilling, done on them during the past autumn. Mr. J. Lanning, Mining Engineer and Ontario Land Surveyor, states that from the results of drilling operations, combined with the two and one-half miles of gypsum outcroppings along the river section, there is no longer any doubt about the continuity and depth of the deposits, which rank among the largest and most extensive anywhere known on the American Continent.

Obituary

MR. DUGALD GEORGE FLETCHER, F.I.C., at Kilcreggan, on March 9, aged 64.

MR. JAMES FLETCHER, M.Sc., A.I.C., manager of the Hendon works of Titanine-Emaillite, Ltd., on February 26, aged 37.

DR. ADOLPH LIEBMANN, at Weybridge, on February 15, aged 75. The following details regarding Dr. Liebmann are abstracted from an account, written by Professor A. G. Green, which appears in the *Journal of the Society of Dyers and Colourists*. He studied chemistry under Kekulé and Clausius. Coming to England in 1881, he became research chemist at the dyestuff works of I. Levinstein and Co., at Blackley, and later, leaving the latter, became a consulting textile and dyeing chemist, in partnership with his friend Dr. A. Studer. Together they established the Sochroite Dyeing Co. in Blackburn. This was later acquired by Kerr and Hoegger, of Newton Heath, the latter company being later incorporated in the British Cotton and Wool Dyers' Association, Ltd. Until his death, Dr. Liebmann continued to be closely associated with the successors of the Sochroite Dyeing Co. Dr. Liebmann had a great reputation as an expert on chemical patents. He gave evidence in the historic case of the Badische Co. v. Levinstein, on behalf of the latter, by whom he was then employed, and in later years was retained by the Badische Co. in many cases, of which the Rhodamine 6 G cases and the sulphuric anhydride litigation with Nobel's deserve mention. In 1914, Lord Moulton (with whom he had been closely associated in earlier years in patent actions) consulted him regarding the establishment of a national dyestuff industry.

References to Current Literature

British

- ANALYSIS.**—The determination of phosphates in sugar cane juice. H. B. Springer and J. G. Davies. *J.S.C.I.*, April 8, pp. 143-144 T.
- GENERAL.**—Some painting defects, their cause and cure. *J. Oil and Col. Chem. Assoc.*, March, pp. 55-74.
- The heat of combustion of the carbon in coke, and the reactivity of coke. M. W. Travers. *J.S.C.I.*, April 8, pp. 128-130 T.
- The optical resolution of chloroiodoacetic acid. A. M. McMath and J. Read. *J. Chem. Soc.*, March, pp. 537-543.
- The action of formaldehyde on wool. H. S. Bell. *J. Soc. Dyers and Col.*, March, pp. 76-79.
- INORGANIC.**—On active nitrogen. II. Reactions with gases. E. J. B. Willey and E. K. Rideal. *J. Chem. Soc.*, March, pp. 669-679.
- OILS.**—Lubricating oils: Laboratory tests in relation to practical results. A. G. Marshall and C. H. Barton. *J.S.C.I.*, April 8, pp. 130-138 T.
- Researches on the chemistry of Estonian shale-oil. I. The isolation and properties of the phenols. P. N. Kogerman. *J.S.C.I.*, April 8, pp. 138-143 T.
- ORGANIC.**—The nitration of *m*-iodophenol. H. H. Hodgson and F. H. Moore. *J. Chem. Soc.*, March, pp. 630-635.
- The condensation of *p*-hydroxybenzoic acid with chloral. F. D. Chattaway and F. C. y Prats. *J. Chem. Soc.*, March, pp. 685-692.
- Aromatic thionyl and dithionyl derivatives. II. 1:2- and 2:3-thionylidihydroxyanthracenes. A. Green. *J. Chem. Soc.*, March, pp. 554-558.
- THYRONIN.**—The chemistry of thyroxine. III. Constitution and synthesis of thyroxine. C. R. Harington and G. Barger. *Biochem. J.*, Vol. XXI, No. 1, 1927, pp. 169-183.

United States

- CATALYSIS.**—The catalytic and specific dynamic actions of certain amino acids. J. M. Ort and J. L. Bollman. *J. Amer. Chem. Soc.*, March, pp. 805-810.
- GAS.**—Compressed gas handling technic. F. A. Ernst. *Chem. Met. Eng.*, March, pp. 151-153.
- GENERAL.**—Some constituents of Spanish moss. A. W. Schorger. *Ind. Eng. Chem.*, March 1, pp. 409-411.
- An investigation of the coexisting liquid and vapour phases of solutions of oxygen and nitrogen. B. F. Dodge and A. K. Dunbar. *J. Amer. Chem. Soc.*, March, pp. 591-610.
- Manganese deficiency in soils and fertilisers. O. Schreiner and P. R. Dawson. *Ind. Eng. Chem.*, March, pp. 400-404.
- INSULIN.**—Studies on insulin. N. R. Blatherwick, F. Bischoff, L. C. Maxwell, J. Berger, and S. Melville. *J. Biol. Chem.*, March, pp. 57-89.
- ORGANIC.**—The reducing action of sodium methylate. H. S. Fry and J. L. Cameron. *J. Amer. Chem. Soc.*, March, pp. 864-873.
- The catalytic formation of mixed cholesteryl ethers. C. E. Bills and F. G. McDonald. *J. Biol. Chem.*, March, 1-11.
- Thymoltrichlorophthalin and some of its derivatives. R. T. K. Cornwell and A. J. Esselstyn. *J. Amer. Chem. Soc.*, March, pp. 826-830.
- PLANT.**—Design and operation of a contact filter plant. H. L. Kaufmann. *Chem. Met. Eng.*, March, pp. 154-158.

German

- ANALYSIS.**—The exactitude of halide and thiocyanate titration according to Fajans and according to the ordinary method in comparison with the results of potentiometric determination. J. M. Kolthoff and L. H. van Berk. *Z. anal. Chem.*, Vol. 70 (10 and 11), pp. 369-394.
- A distillation method for the separation of antimony from the alkalis, and the determination of very small quantities of antimony. G. Jander and W. Brüll. *Annalen*, March 28, pp. 332-337.
- COLLOIDS.**—Colloidal zinc. W. Engelhardt. *Kolloid-Z.*, March, pp. 234-242.
- On the sensitisation of sols by small quantities of other

colloids. B. Ghosh and N. R. Dhar. *Kolloid-Z.*, March, pp. 229-234.

GENERAL.—The oxidation of benzene by air. M. Freund. *Z. angew. Chem.*, March 31, pp. 368-374.

Studies on drying substances. H. Wolff. *Farben-Z.*, April 2, pp. 1490-1491.

Contributions to the knowledge of vitriol preparation. II. Investigation of the system copper sulphate-sulphuric acid-water. G. Agde and H. Barkholt. *Z. angew. Chem.*, March 31, pp. 374-379.

ORGANIC.—A homoeugenol: 1-(4-methoxyphenyl)-butene-2. C. Mannich and K. W. Merz. *Arch. Pharm.*, February, pp. 104-106.

The structure of silk fibroin. I. Structure of peptone prepared from silk. E. Abderhalden and E. Schnitzler. *Z. Physiol. Chem.*, March 11, pp. 159-181.

Syntheses of amino-acids. A. Skita and C. Wulff. *Annalen*, March 28, pp. 190-210.

A new γ -pyrone synthesis. W. Borsche and W. Peter. *Annalen*, March 28, pp. 148-162.

ORGANO-METALLIC COMPOUNDS.—Arsenic derivatives of the quinoline group. A. Binz and C. R  th. *Annalen*, March 28, pp. 238-248.

VITAMINS.—The formation of vitamins by *B. vulgatus* and the influence of the p_H of the culture medium on the quantity of vitamin B formed. A. Scheunert and M. Schieblch. *Annalen*, March 28, pp. 249-258.

VULCANISATION.—Contribution to the knowledge of sulphur and to the theory of vulcanisation accelerators. P. Scholz. *Kautschuk*, March, pp. 101-103.

Ultramicroscopic studies of the theory of vulcanisation. H. Dannenburg. *Kautschuk*, March, pp. 104-105.

Miscellaneous

ANALYSIS.—Analysis of tannins and tanning substances. E. Toussaint. *Rev. Chim. Ind.*, February, pp. 51-54.

Method of determination of coloured gases, based on the use of the photoelectric cell. M. Clergeot. *Chim. et Ind.*, March, pp. 375-382.

APPARATUS.—A simple laboratory emulsifier. R. C. Smith. *Rev. G  n. Collo  des*, January, pp. 412-414.

COLLOIDS.—The colloidal properties of peat. A. Doumanski. *Bull. Soc. Chim.*, February, pp. 166-184.

Complexity and micelles. Introduction to the study of colloids. G. Malfitano and M. Ligaud. *J. Chim. Phys.*, February 25, pp. 103-109.

ELECTROCHEMISTRY.—The electrolysis of insoluble alkaline earth compounds and of barium carbonate in particular. O. Dony and F. Meunier. *Bull. Acad. Belg. (Classe des Sciences)*, 1927, No. 1, pp. 9-27.

OILS.—Some information on fish oils. G. Hinard. *Rev. G  n. Collo  des*, January, pp. 405-411.

ORGANIC.—Opium alkaloids. VII. The synthesis of laudanine and of laudanidine. E. Sp  th and A. Burger. *Monatshelte*, February 25, pp. 733-740.

Some observations on the oxidation of ricinoleic acid with nitric acid. The conditions underlying the formation of suberic acid. P. E. Verkade. *Rec. Trav. Chim. Pays-Bas*, March 15, pp. 137-143.

PHASE RULE.—Equilibrium in the system glucose-sodium chloride-water. S. Matsuura. *Bull. Chem. Soc. Jap.*, February, pp. 44-48.

PHYSICAL.—Dissociation pressures of the carbonates of calcium, strontium, and barium. W. Dutort. *J. Chim. Phys.*, February 25, pp. 110-114.

The ionisation potential in relation to some physico-chemical properties. N. Perrakis. *J. Chim. Phys.*, February 25, pp. 120-128.

The sorption of gas by charcoal as a dissolution phenomenon. J. Sameshima. *Bull. Chem. Soc. Jap.*, January, pp. 1-10.

The thermal dissociation of alkali borofluorides. J. H. de Boer and J. A. M. van Liempt. *Rec. Trav. Chim. Pays-Bas*, March 15, pp. 124-132.

The activity of chlorine at various partial pressures. N. Kameyama, H. Yamamoto, and S. Oka. *Proc. Imp. Acad. Jap.*, January, pp. 41-43.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

- 267,018. DECOMPOSITION OF HYDROGEN SULPHIDE AND ITS REMOVAL FROM INDUSTRIAL GASES, PROCESS FOR. W. Carpmal, London. From I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, September 17, 1926.

Hydrogen sulphide in gaseous mixture can be oxidised to free sulphur and water by mixing the gas with air or oxygen and passing it over active carbon. In this invention, the active carbon is finely powdered and maintained in suspension in the gas and carried forward by it. Effective contact between the gas and carbon is maintained by passing through a disintegrator mill, and the oxidation process is accelerated by the heat produced by agitation of the gas and also its partial ionisation due to the electrical action. The sulphur is absorbed by the carbon which is separated out in a cyclone apparatus and finally in an electrical precipitator, from which the gas issues free from sulphur. The carbon powder is then passed over a series of inclined surfaces treated to a high temperature so that the sulphur is vaporised. Alternatively, the carbon powder may be carried on a travelling band on which a solvent such as dichloro methane is sprayed. The travelling band then passes over heated rollers to vaporise the solvent so that pure carbon is obtained. Sulphur is then recovered from the solution.

- 267,177. VAT DYESTUFFS AND INTERMEDIATE PRODUCTS, MANUFACTURE OF. O. Y. Imray, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, October 12, 1925.

These dyestuffs are obtained by oxidation of 6-chloro-7-methoxythio-naphthene, or by condensation of 6-chloro-7-methoxythio-naphthene or the corresponding thionaphthene quinone or an anil thereof with a usual indigoid dyestuff component. The fastness of the dyestuffs can be increased by halogenation. To obtain the intermediate substance, 6-chloro-orthotoluidine is diazotised and the diazo compound treated with alkali xanthate in alkaline solution. The product is saponified and condensed with chloroacetic acid to obtain 2-methyl-3-chloro-1-phenylthioglycolic acid. The latter when treated with a condensing agent yields 6-chloro-7-methyl-3-oxythionaphthene. This may be converted into an anil of the corresponding thionaphthene-quinone by treating with an aromatic nitroso compound such as paranitroso-dialkylarylamine, or nitrosophenol. The anil may be treated with sulphuric acid to obtain the quinone. Detailed examples are given of the production of 6-chloro-7-methoxythionaphthene, and its oxidation and condensation by various components, with particulars of the dyestuffs obtained.

- 267,191. OXIDE OF LEAD, MANUFACTURE OF. H. Waring, Highfield, 94, Cambridge Road, Great Crosby, Liverpool, and Associated Lead Manufacturers, Ltd., London House, 3, New London Street, London, E.C.3. Application date, November 12, 1925.

In the manufacture of lead oxide by agitation of molten lead and the passage of air through it, some of the lead is carried into suspension with the lead oxide. This may be avoided by dispersing the incompletely oxidised lead in a freshly formed state while it still retains its initial heat. If the material is sufficiently finely dispersed in an oxidising atmosphere any metallic lead will be oxidised. The dispersion is effected by subjecting the material to impact at a velocity of 20,000 ft. per minute upon a high-speed rotating pulveriser. The incompletely oxidised lead is first subjected to settling to remove the finest oxidised particles.

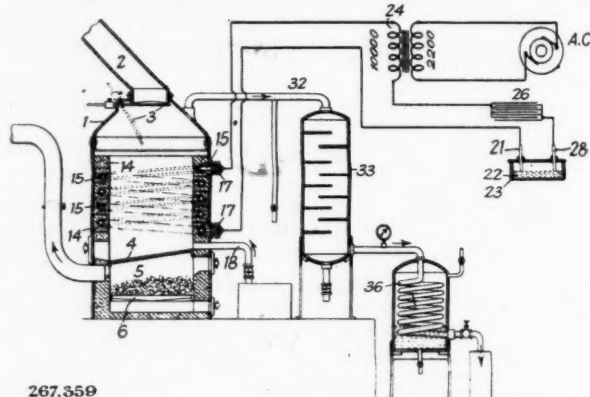
- 267,246. RECOVERY OF SULPHUR. J. Y. Johnson, London. From I. G. Farbenindustrie Ges. Akt.-Ges., Frankfurt-on-Main, Germany. Application date, December 17, 1925.

Active charcoal which contains sulphur due to catalytic oxidation of sulphuretted hydrogen is treated with superheated steam at a speed of at least 1 metre per second. The superheat should be about 220°-250° C. and the steam should be

passed in a downward direction, when the sulphur is expelled in a liquid condition. The carbon is thus completely desulphurised and regenerated. The steam is passed through a washer and then returned through the superheater to the active charcoal container.

- 267,359. BENZOL AND LIKE AROMATIC HYDROCARBONS, MANUFACTURE OF. I. W. Henry, Greenwich, Fairfield County, Conn., U.S.A. Application date, May 28, 1926.

Benzol and other aromatic hydrocarbons are obtained by treating bituminous coal with hydrogen at a high temperature in an alternating magnetic field. A vertical retort 1 is provided with a charging shoot 2 having a pivoted door 3 and a partition 4 to support the coal. A lower chamber 5 is provided with a fire grate 6 to heat the coal. The retort is lined with firebrick 14 in which is embedded an insulated conductor 15 which is connected through insulators 17 to the secondary 24



267,359

of a transformer, which is in series with a condenser 26 and with the device 23 in which arcs are formed between copper electrodes 21, 28 and the surface of the mercury 22. Hydrogen is supplied to the retort by a pipe 18. An alternating magnetic field is produced in the retort and facilitates the production of benzol from the coal and hydrogen. The coal is used in powdered form, and is mixed with about 10 per cent. of limestone. The voltage of the secondary 24 is about 10,000, and the electric arc produces oscillations having a frequency of about 50,000 per second. The charge of coal below is preferably heated to about 900° F. The hydrocarbon vapours produced are passed through a pipe 32 to a gas scrubber 33 and condenser 36.

- 267,364. CONVERSION OF MINERAL OILS OF HIGHER BOILING POINT INTO ALIPHATIC HYDROCARBONS OF LOW BOILING POINT, PROCESS FOR. F. W. Todt, 30, Ahornstrasse, Berlin Steglitz, Germany, and P. Sumpf, 6, Courbierrasse, Berlin W., Germany. Application date, June 2, 1926.

The oil is vaporised and introduced into a heated chamber containing highly porous absorptive substances such as pumice stone or coke, and cracked at a temperature of 400°-600° C. The constituents of the first cracking which are too heavy are separated and again treated in separate stills. The cracking period of each stage is as short as possible so that little gas is produced.

- 267,366. OXYCARBOXY-*p*-DIAMINE-DIARYL-SULPHONES AND OXYCARBOXY-*p*-AMINO OXYDIARYL SULPHONES, MANUFACTURE OF. W. Carpmal, London. From I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, June 7, 1926.

These sulphones are obtained by condensing an aromatic *o*-oxycarboxy-sulphinic acid with an oxidation product of a *p*-diamine or a substitution product, or an *N*-alkyl or dialkyl

(Continued on page 381)

(Continued from page 380)

derivative thereof (*i.e.*, a *p*-quinone di-imine or an oxidation product of a *p*-amino-phenol or a substitution product, *i.e.*, a *p*-quinone-mono-imine). The *o*-oxycarboxy-sulphonic acid is obtained by gentle reduction of the sulpho-chlorides of the aromatic oxy-carboxylic acids, or by the decomposition of diazo compounds with sulphur dioxide in the presence of copper. The products constitute components for the manufacture of indamines, indophenols, and azo dyestuffs. A number of examples are given.

NOTE.—Abstracts of the following specifications which are now accepted appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—243,339 (F. J. Donnelly), relating to conversion of heavy or complex hydrocarbon oils into lighter oils, see Vol. XIV, p. 113; 244,134 (I. W. Cederberg), relating to catalytic combustion of mixtures of ammonia and oxygen, see Vol. XIV, p. 185; 245,092 (Cochrane Corporation), relating to base exchange substances, see Vol. XIV, p. 233; 252,694 (I. G. Farbenindustrie Akt.-Ges.), relating to condensation products containing sulphur, see Vol. XV, p. 164; 254,287 (I. G. Farbenindustrie Akt.-Ges.), relating to obtaining light oils by washing gases, see Vol. XV, p. 233; 254,340 and 254,743 (I. G. Farbenindustrie Akt.-Ges.), relating to tetrahalogen-4:4'-dimethyl-thioindigos and hexa-substituted thioindigos, see Vol. XV, pp. 256 and 279.

International Specifications not yet Accepted

265,197. TREATING PHOSPHATES. Rhenania-Kunheim Verein Chemischer Fabriken Akt.-Ges., Berlin, and H. Brenek, Porz, near Cologne, Germany. International Convention date, February 1, 1926. Addition to 242,512.

Specification 242,512 (see THE CHEMICAL AGE, Vol. XIII, p. 606) describes the calcination of a mixture of crude phosphate, alkali carbonate, and silicic acid to obtain alkali dicalcium phosphate. In this invention, steam is also present, and the undesirable effect of any fluorides or gypsum is avoided. The steam may be derived from the use of fuels such as water, gas or oil.

265,203. DYES. J. R. Geigy Akt.-Ges., 51, Riehenring, Basle, Switzerland. International Convention date, January 28, 1926.

Mordant dyestuffs for chrome printing on cotton and for dyeing wool in shades fast to fulling and potting when after-chromed, are obtained by diazotising a diarylmethane derivative containing an amino group in one nucleus, and an *o*-carboxylic grouping in the other, and coupling with an azo dye component. The amino-diarylmethane derivatives are obtained by treating an aromatic chlormethyl-*o*-carboxylic acid with an amine of the benzene or naphthalene series. In one example of the process, aniline-methylene-*o*-cresotinic acid is diazotised and coupled with 1-naphthol-3:6-disulphonic acid, to obtain a product which gives a red shade when chrome printed on cotton. Other examples, with the shades obtained, are given.

265,224. ISATIN DERIVATIVES. I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, January 28, 1926.

Salts of N-arylsulpho-aniline or its homologues or substitution products are condensed with oxalyl chloride in presence of an inert diluent. The oxamic acid chlorides are treated with aluminium chloride to obtain N-arylsulpho-isatins which yield the isatins on saponification. In examples, *p*-toluene-sulpho-3-chlor-4-toluidine is obtained by fusing 3-chlor-4-toluidine with *p*-toluene-sulphochloride and sodium acetate, and is then used in the preparation of N-arylsulpho-isatins.

265,232. DYES. I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, January 29, 1926. Addition to 237,294.

The dyestuffs described in Specification 237,294 (see THE CHEMICAL AGE, Vol. XIII, p. 333) can be obtained by condensing naphthalene 1:4:5:8-tetracarboxylic acid or its dianhydride with an *o*-nitroamino compound, and reducing the di-*o*-nitroarylimides by means of hydrosulphite or sodium sulphide, or iron and acetic acid. In an example, the dianhydride is heated with 3-nitro-4-amino-1-phenetol or *o*-nitraniline in nitrobenzene, and the product reduced with iron and acetic acid.

265,233. ESTERS. I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, January 29, 1926.

Glycol esters, such as the monoacetate and diacetate, are obtained by heating alkylene oxides such as ethylene oxide or their substitution products free from halogen, with organic acids such as acetic acid, or their anhydrides, in the presence of catalysts such as mineral acids, acid salts such as sodium bisulphate, salts of organic acids with strong bases, and alkali metal salts of the carboxylic acids.

265,234. TREATING HYDROCARBONS. I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, January 29, 1926.

Saturated hydrocarbons or their mixtures are incompletely burnt with pure oxygen or with gases containing above 50 per cent. of oxygen, at temperatures above 850° C. The products include unsaturated hydrocarbons such as acetylene and its polymerisation products. Thus, methane may be preheated to 900° C. and passed through a flame zone in a quartz tube at a temperature above 1,000° C. The products include hydrogen, carbon monoxide, and acetylene. The acetylene may be dissolved in acetone or converted into acetaldehyde or acetic acid. Ethane may be similarly treated to obtain ethylene.

265,545. BENZOYL-*o*-BENZOIC ACID DERIVATIVES. Newport Co., Carrollville, Wis., U.S.A. (Assignees of R. Adams and J. M. Davidson, Urbana, Ill., U.S.A., and I. Gubelmann, 1202, Fairview Avenue, South Milwaukee, Wis., U.S.A.) International Convention date, February 8, 1926.

4-chloro-3-nitrobenzoyl-*o*-benzoic acid is heated with ammonia or a primary or secondary amine to obtain 4-amino-3-nitrobenzoyl-*o*-benzoic acid and its derivatives in which the hydrogen of the amino group is replaced by an alkyl, aryl, or substituted alkyl or aryl group.

265,550. LITHOPONE. New Jersey Zinc Co., 160, Front Street, Manhattan, New York. (Assignees of F. G. Breyer, Palmerton, Pa., U.S.A., and C. W. Farber, Bowmanstown, Pa., U.S.A.) International Convention date, February 2, 1926.

The precipitation of the barium sulphide and zinc sulphate solutions is effected in the presence of electrolytes such as sodium or other chloride, sodium or potassium sulphate, or sulphuric acid, equivalent in amount to 0.75–1 gm. of chlorine per litre of 25° Bé zinc sulphate solution at 20° C. A relatively high ratio of hydrate to sulphhydrate in the product is also established as described in Specifications 263,119 and 263,120 (see THE CHEMICAL AGE, Vol. XVI, p. 190). The product is filter-pressed and dried to contain 4–10 per cent. of moisture, and calcined at 725°–800° C.

265,553. DYES. Newport Co., Carrollville, Wis., U.S.A. (Assignees of J. B. Oesch, 589, Superior Street, Milwaukee, Wis., U.S.A.) International Convention date, February 6, 1926.

A diazotised aminoazo body of the benzene series containing one or two sulphonic groups and one to four methyl groups, is coupled with *m*-toluidine, rediazotised and coupled with *m*-toluidine, and the trisazo dye rediazotised and coupled with 1-phenyl-3-methyl-5-pyrazolone or a sulphonic acid thereof. In an example, sodium aminoazo-toluene disulphonate is obtained from diazotised 2-toluidine-5-sulphonic acid and 2-toluidine-4-sulphonic acid and is used as the first component, while 1-*p*-sulphophenyl-3-methyl-5-pyrazolone (sodium salt) is used as end component. The products give fast orange to brown shades on unmordanted cotton.

265,601. ETHYLNAPHTHALENES. I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, February 4, 1926.

Naphthalene, hydrogenated naphthalenes, or substituted naphthalenes are condensed with ethylene at 50°–200° C. and under pressure, in presence of aluminium chloride or iron chloride. The products are mono- or poly-ethylnaphthalene or higher condensation products. Highly viscous, strongly fluorescent oils may be obtained.

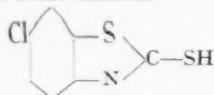
265,624. OXIDISING CARBON MONOXIDE. I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, February 8, 1926.

Absorption of carbon monoxide by oxidation in respirators with the use of catalysts such as metallic ores is facilitated

by drying the gas by absorptive gels so that deterioration of the catalyst by absorption of water is prevented. Hydrogen sulphide and iron carbonyl are also absorbed by the gel. Silica, alumina, or stannic acid gel may be used.

265,919. VULCANISING RUBBER. Goodyear Tire and Rubber Co., 1144, East Market Street, Akron, Ohio, U.S.A. (Assignees of J. Teppema, Tallmadge, Ohio, U.S.A.) International Convention date, February 12, 1926.

A halogen derivative of a mercapto-thiazole, mercapto-aryl-thiazole, or mercapto-benzo-thiazole is used as a vulcanisation accelerator. In an example, 6-amido-2-mercapto-benzo-thiazole is diazotised and the amino group replaced by chlorine to obtain 6-chlor-2-mercapto-benzo-thiazole.



265,920. VULCANISING RUBBER. Goodyear Tire and Rubber Co., 1144, East Market Street, Akron, Ohio, U.S.A. (Assignees of L. B. Sebrell, Cuyahoga Falls, Ohio, U.S.A.) International Convention date, February 12, 1926.

A mercapto-aryl-thiazole, or a metallic salt, whose substituted aryl structure includes an element having an atomic weight of more than 13 is employed as a vulcanisation accelerator. Examples include 6-nitro-2-mercapto-benzothiazole prepared by treating 2-mercapto-benzothiazole with concentrated nitric acid, halogenated and sulphinated derivatives, and amido compounds prepared by treating the above with tin and hydrochloric acid.

265,930-1. VULCANISING RUBBER. Grasselli Chemical Co., 1,300, Guardian Building, Cleveland, Ohio, U.S.A. (Assignees of W. B. Burnett and I. Williams, Mellon Institute, Pittsburg, U.S.A.) International Convention date, February 12, 1926.

265,930. This is an addition to 249,113 (See THE CHEMICAL AGE, Vol. XIV, p. 527). Condensation products of one molecule of a primary amine and two or more molecules of an α , β saturated aldehyde are used as vulcanisation accelerators. Suitable amines are aniline, *n*-butylamine, and *o*-tolyl guanide, and aldehydes include *n*-butyraldehyde, heptaldehyde and propionaldehyde. Acid condensing agents employed include weak organic acids such as acetic, propionic, *n*-butyric, stearic, oleic, salicylic, and picric, but mineral acids, acid anhydrides, acid halides, or salts such as zinc chloride may be used.

265,931. This is an addition to 263,853 (see THE CHEMICAL AGE, Vol. XVI, p. 264). The aldehyde-amine condensation products are produced in the presence of an acid or acidic substance in the proportion of 0.2 molecular parts for each part of amine. Suitable acids include acetic, propionic, *n*-butyric, stearic, oleic, salicylic, picric, hydrochloric, phosphoric, sulphuric, and acidic substances include zinc chloride, amine salts, and acid anhydrides and halides. As an example, *o*-toluidine and cinnamic aldehyde may be used. Several other examples are given, as well as examples of rubber mixtures employing these accelerators.

265,938. PLATINUM CATALYSTS. T. von Artner, 20, Lützow-Ufer, Berlin. International Convention date, February 15, 1926.

A porous carrier such as magnesium sulphate or a ceramic material is impregnated with a volatile organic solvent such as alcohol, and then brought into contact with a platinum solution and dried.

265,948. METHYL ALCOHOL. Soc. Française de Catalyse Généralisée, 16, Rue Lacretelle, Paris. (Assignees of C. Henry.) International Convention date, February 9, 1926.

Methyl alcohol is obtained synthetically from carbon monoxide and hydrogen, using a catalyst of strontium and lead oxide, or zinc and bismuth trioxide. The catalyst is mounted on unsymmetrically perforated discs of porous earth and upon the inner walls of a reaction vessel. In an example, a catalyst of 3Sr + PbO is employed in the proportion of 1:159 of the gases present. A temperature of 200°C. and pressure of 10 atmospheres may be employed.

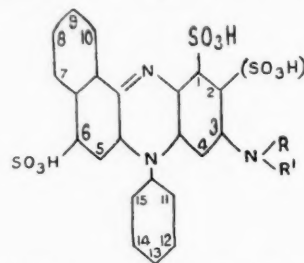
265,985. DIAZO COMPOUNDS. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, February 12, 1926.

The preparation of diazo-*p*-chlorbenzene-sulphonates is

described from nitranilines, chlornitranilines, dichloranilines, chlor- or nitro-toluidines, nitroaminophenol alkyl ethers, and *o*-aminophenol aryl ethers and their unsulphonated substitution products. The mineral acid diazo salt solutions are treated with a metal *p*-chlorbenzene-sulphonate or with free *p*-chlorbenzene-sulphonic acid. The treatment of *o*-amino-diphenyl ether, *p*-nitraniline, and 5-nitro-2-aminophenol methyl ether is described.

265,986. DYES. J. R. Geigy Akt.-Ges., 51, Riehenring, Basle, Switzerland. International Convention date, February 13, 1926.

An isorosinduline di- or trisulphonic acid of the formula



(R and R' = hydrogen, alkyl, aralkyl, or aryl.)

in which one sulphonyl group is in position 1 or 2, another in position 6, and a third if present is in any position, is condensed with a sulphonic acid of an unsymmetrical *N*-alkyl-*p*-phenylene-diamine derivative or homologue or an unsymmetrical *N*-acyl-*p*-phenylene-diamine derivative or homologue (with subsequent saponification of the acyl-amino group), in which a sulphonyl group exists in ortho position to the primary amino group. Instead of the *p*-phenylene-diamine component, a sulphonic acid of a *p*-amino-phenol derivative or homologue in which a sulphonyl group exists in the ortho position to the primary amino group may be used. In an example, the product obtained from *p*-nitrochlorbenzene-sulphonic acid and diethylamine is reduced, and the sodium salt of the diethyl-*p*-phenylene-diamine sulphonic acid is mixed with a boiling alcoholic solution of phenyl- β -naphthylamine. By oxidation with sodium bichromate in presence of acetic acid, diethyl isorosinduline-2-mono-sulphonic acid is obtained, and can be converted into the 2:6-disulphonic acid by bisulphite. Blue or green-blue dyestuffs fast to alkali are obtained.

Specifications Accepted with Date of Application

- 245,127. Filter diaphragms for electrolytic purposes. J. Billiter and Siemens and Halske Akt.-Ges. December 23, 1924.
- 245,152. Concentrated solutions of alkali cyanides, Process for the production of. Deutsche Gold- und Silber Scheideanstalt vorm. Roessler. December 23, 1924.
- 265,540. Moulded sulphur, Manufacture of. Rhenania Verein Chemischer Fabriken Akt.-Ges. February 3, 1926.
- 267,990. Potassium nitrate, Process for the manufacture of. A. Lambert. November 18, 1925.
- 267,999. Soap, Manufacture of. A. H. Charlton and Rowe and Co. November 24, 1925.
- 268,006. Oxidising coal, Process for. W. A. Bone, R. Quarendon, and Gas Light and Coke Co. December 14, 1925.
- 268,011. Silicious alkaline earth compounds, Manufacture of. A. J. H. Haddan. (Celite Co.) December 18, 1925.
- 268,024. Recovering sulphur compounds of ammonia in the form of salts from gas mixtures containing sulphuretted hydrogen and ammonia. F. Siemens Akt.-Ges. and H. Bahr. December 23, 1925.
- 268,104. Lead nitrate, process for the manufacture of. W. H. Bentley and W. Blythe and Co., Ltd. February 24, 1926.
- 268,158. Vanillin, Separation and purification of. J. Tcherniac. April 27, 1926.
- 268,181. Sodium chloride, Manufacture of. A.P.I.C.E. Soc. Anon. Prodotti Italiani Chimici Estrattivi and O. Gasparriani. June 1, 1926.
- 268,200. Copper alloys. M. G. Corson. July 21, 1926.
- 268,201. Zinc ores and other zinciferous materials, Process of and apparatus for the treatment of. W. Job. July 22, 1926.
- 268,219. Preserving latex, Method of—and product obtained thereby. General Rubber Co. June 8, 1926.
- 268,225. Copper alloys. Metallbank und Metallurgische Ges. Akt.-Ges. April 15, 1926.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.
 ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.
 ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.
 ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.
 ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
 AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.
 BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.
 BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.
 BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
 CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.
 COPPER SULPHATE.—£25 to £25 10s. per ton.
 METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.
 NICKEL SULPHATE.—£38 per ton d/d.
 NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
 POTASH CAUSTIC.—£30 to £33 per ton.
 POTASSIUM BICHROMATE.—4½d. per lb.
 POTASSIUM CHLORATE.—3½d. per lb., ex wharf, London, in cwt. kegs.
 SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.
 SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.
 SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.
 SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.
 SODIUM ACETATE 97/98%.—£21 per ton.
 SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.
 SODIUM BICHROMATE.—3½d. per lb.
 SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton for home market, 1-cwt. drums included.
 SODIUM CHLORATE.—2½d. per lb.
 SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.
 SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.
 SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.
 SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.
 SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.
 SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—8d. per lb. Crude 60's, 1s. 8d. to 1s. 9½d. per gall.
 ACID CRESYLIC 99/100.—2s. 6d. to 2s. 8d. per gall. Steady. 97/99.—2s. to 2s. 2d. per gall. Pale, 95%, 1s. 10d. to 2s. 2d. per gall. Dark, 1s. 9d. to 2s. per gall.
 ANTHRACENE.—A quality, 2½d. to 3d. per unit. 40%, 3d. per unit.
 ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.; both according to gravity.
 BENZOLE.—Crude 65's, 1s. 2½d. to 1s. 3½d. per gall., ex works in tank wagons. Standard Motor, 1s. 9d. to 2s. 4d. per gall., ex works in tank wagons. Pure, 2s. to 2s. 3d. per gall., ex works in tank wagons.
 TOLUOLE.—90%, 2s. 1d. to 2s. 2d. per gall. Firm. Pure, 2s. 3d. to 2s. 4d. per gall.
 XYLOL.—2s. 1d. to 2s. 6d. per gall. Pure, 3s. per gall.
 CREOSOTE.—Cresylic, 20/24%, 10½d. per gall. Standard specification, 6½d. to 9d.; middle oil, 7½d. to 8d. per gall. Heavy, 8½d. to 9d. per gall. Salty, 7d. per gall. less 1½%.
 NAPHTHA.—Crude, 9d. to 9½d. per gall. according to quality. Solvent 90/100, 1s. 8d. per gall. Solvent 95/100, 1s. 7d. to 1s. 8d. per gall. Solvent 90/100, 1s. 4d. per gall.
 NAPHTHALENE CRUDE.—Drained Creosote Salts, £8 per ton. Whizzed or hot pressed, £8 10s. to £9 per ton.
 NAPHTHALENE.—Crystals, £13 10s. per ton. Quiet. Flaked, £12 10s. per ton, according to districts.
 PITCH.—Medium soft, 83s. to 85s. per ton, according to district; nominal.
 PYRIDINE.—90/140, 9s. 6d. to 10s. per gall. Nominal. 90/180, 5s. per gall. Heavy, 5s. to 8s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:
 ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.
 ACID ANTHRANILIC.—6s. per lb. 100%.
 ACID BENZOIC.—1s. 9d. per lb.
 ACID GAMMA.—4s. 9d. per lb.
 ACID H.—3s. 3d. per lb. 100% basis d/d.
 ACID NAPHTHIONIC.—1s. 6d. per lb. 100% basis d/d.
 ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.
 ACID SULPHANILIC.—9d. per lb. 100% basis d/d.
 ANILINE OIL.—7d. per lb. naked at works.
 ANILINE SALTS.—7d. per lb. naked at works.
 BENZALDEHYDE.—2s. 3d. per lb.
 BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.
 BENZOIC ACID.—1s. 8½d. per lb.
 o-CRESOL 29/31° C.—4d. per lb. Fair inquiry.
 m-CRESOL 98/100%.—2s. 8½d. per lb. Only limited inquiry.
 p-CRESOL 32/34° C.—2s. 8½d. per lb. Only limited inquiry.
 DICHLORANILINE.—2s. 3d. per lb.
 DIMETHYLANILINE.—2s. per lb. d/d. Drums extra.
 DINITROBENZENE.—9d. per lb. naked at works. £75 per ton.
 DINITROCHLOROBENZENE.—£84 per ton d/d.
 DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.
 DIPHENYLAMINE.—2s. 10d. per lb. d/d.
 a-NAPHTHOL.—2s. per lb. d/d.
 B-NAPHTHOL.—11d. to 1s. per lb. d/d.
 a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.
 B-NAPHTHYLAMINE.—3s. per lb. d/d.
 o-NITRANILINE.—5s. 9d. per lb.
 m-NITRANILINE.—3s. per lb. d/d.
 p-NITRANILINE.—1s. 9d. per lb. d/d.
 NITROBENZENE.—6d. per lb. naked at works.
 NITRONAPHTHALENE.—1s. 3d. per lb. d/d.
 R. SALT.—2s. 2d. per lb. 100% basis d/d.
 SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.
 o-TOLUIDINE.—7½d. to 8d. per lb. naked at works.
 p-TOLUIDINE.—2s. 2d. per lb. naked at works.
 m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 5s. per ton. Grey, £15 10s. per ton. Liquor, 9d. per gall. 32° Tw.
 CHARCOAL.—£6 15s. to £10 per ton, according to grade and locality.
 IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.
 RED LIQUOR.—9d. to 1s. per gall. 16° Tw.
 WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.
 WOOD NAPHTHA, MISCIBLE.—4s. to 4s. 3d. per gall., 60% O.P. Solvent, 4s. 3d. per gall., 40% O.P.
 WOOD TAR.—£4 to £5 10s. per ton and upwards, according to grade.
 BROWN SUGAR OF LEAD.—£40 10s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5½d. per lb., according to quality. Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.
 ARSENIC SULPHIDE, YELLOW.—2s. per lb.
 BARYTES.—£3 10s. to £6 15s. per ton, according to quality.
 CADMIUM SULPHIDE.—2s. 9d. per lb.
 CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.
 CARBON BLACK.—5½d. per lb., ex wharf.
 CARBON TETRACHLORIDE.—£46 to £53 per ton, according to quantity, drums extra.
 CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
 DIPHENYLGUANIDINE.—3s. 9d. per lb.
 INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5½d. to 6½d. per lb.
 LAMP BLACK.—£35 per ton, barrels free.
 LEAD HYPOSULPHITE.—9d. per lb.
 LITHOPONE, 30%.—£22 10s. per ton.
 MINERAL RUBBER "RUBPRON".—£13 12s. 6d. per ton, f.o.r. London.
 SULPHUR.—£9 to £11 per ton, according to quality.
 SULPHUR CHLORIDE.—4d. per lb., carboys extra.
 SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.
 THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.
 THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.
 VERMILION, PALE OR DEEP.—5s. 3d. per lb.
 ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 6d. per lb. Firm and brisk.

ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. per oz.; 500 oz. lots, 1s. per oz.

ACID, BORIC B.P.—Crystal, £41 per ton; powder, £45 per ton. Carriage paid any station in Great Britain, in ton lots.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 5½d. to 1s. 5¾d. per lb., less 5%. Firm.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.

ACID, SALICYLIC, B.P.—1s. 3½d. to 1s. 4½d. per lb. Technical.—11½d. to 1s. per lb. Both in good demand.

ACID, TANNIC B.P.—2s. 9d. to 2s. 11d. per lb.

ACID, TARTARIC.—1s. 2d. per lb., less 5%. Firm market.

AMIDOL.—9s. per lb., d/d.

ACETANILIDE.—1s. 6d. to 1s. 8d. per lb. for quantities.

AMIDOPYRIN.—8s. 6d. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.

AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimed: lump, 1s. per lb.; powder, 1s. 3d. per lb.

ATROPINE SULPHATE.—11s. per oz. for English make.

BARBITONE.—6s. 6d. per lb.

BENZONAPHTHOL.—3s. 3d. per lb. spot.

BISMUTH CARBONATE.—9s. 9d. to 10s. per lb.

BISMUTH CITRATE.—9s. 6d. to 9s. 9d. per lb.

BISMUTH SALICYLATE.—8s. 9d. to 9s. per lb.

BISMUTH SUBNITRATE.—7s. 9d. to 8s. per lb.

BISMUTH NITRATE.—5s. 9d. to 6s. per lb.

BISMUTH OXIDE.—13s. 9d. to 14s. per lb.

BISMUTH SUBCHLORIDE.—11s. 9d. to 12s. per lb.

BISMUTH SUBGALLATE.—7s. 9d. to 8s. per lb. Extra and reduced prices for smaller and larger quantities respectively; Liquor Bismuthi B.P. in W. Qts. 1s. 1d. per lb.; 12 W. Qts. 1s. per lb.; 36 W. Qts. 11½d. per lb.

BORAX B.P.—Crystal, £24 per ton; powder, £25 per ton. Carriage paid any station in Great Britain, in ton lots.

BROMIDES.—Potassium, 1s. 11d. to 2s. 1d. per lb.; sodium, 2s. 2d. to 2s. 4d. per lb.; ammonium, 2s. 4d. to 2s. 6d. per lb., all spot.

CALCIUM LACTATE.—1s. 3½d. to 1s. 4½d.

CHLORAL HYDRATE.—3s. 2d. to 3s. 5d. per lb., duty paid.

CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

ETHER METH.—1s. 1d. to 1s. 11½d. per lb., according to sp. gr. and quantity. Ether purif. (Aether B.P., 1914), 2s. 3d. to 2s. 4d., according to quantity.

FORMALDEHYDE.—£39 per ton, in barrels ex wharf.

GUAIACOL CARBONATE.—5s. per lb.

HEXAMINE.—2s. 4d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 5d. per gallon f.o.r. makers' works, naked.

HYDROQUINONE.—4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

IRON AMMONIUM CITRATE B.P.—2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.

IRON PERCHLORIDE.—22s. per cwt., 112 lb. lots.

MAGNESIUM CARBONATE.—Light Commercial, £33 per ton net.

MAGNESIUM OXIDE.—Light commercial, £67 10s. per ton, less 2½%; Heavy Commercial, £22 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.

MENTHOL.—A.B.K. recrystallised B.P., 18s. 9d. per lb. net; Synthetic, 11s. to 12s. per lb., according to quantity; 10s. 6d. for 1 cwt. lots and upwards; Liquid (95%), 12s. per lb.; Detached Cryst., 14s. 6d. per lb.

MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10d. to 5s. 11d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 9d. per lb.

METHYL SULPHONAL.—11s. per lb.

METOL.—11s. per lb. British make.

PARA-FORMALDEHYDE.—1s. 9d. per lb. for 100% powder.

PARALDEHYDE.—1s. 4d. per lb.

PHENACETIN.—3s. per lb.

PHENAZONE.—4s. 6d. per lb.

PHENOLPHALEIN.—6s. to 6s. 3d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—96s. per cwt. less 2½% for ton lots.

POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb. for 1 cwt. lots.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 6d. per lb., spot.

QUININE SULPHATE.—2s. per oz., 1s. 8d. to 1s. 9d. for 1000 oz. lots in 100 oz. tins.

RESORCIN.—4s. per lb., spot.

SACCHARIN.—55s. per lb. Very limited inquiry.

SALOL.—2s. 4d. per lb.

SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.

SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923—2s. to 2s. 1d. per lb. for 1 cwt. lots. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.

SODIUM FERROCYNANIDE.—4d. per lb., carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 95s. per cwt., according to quantity. Crystals, 5s. per cwt. extra.

SODIUM SALICYLATE.—Powder, 1s. 9d. to 1s. 10d. per lb. Crystal, 1s. 10d. to 1s. 11d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.

SULPHONAL.—7s. 6d. per lb.

TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 2d. per lb.

THYMOL.—Puriss., 11s. 6d. to 12s. per lb., according to quantity. Firmer. Natural, 14s. 9d. per lb. Cheaper.

Perfumery Chemicals

ACETOPHENONE.—7s. 3d. per lb.

AUBEPINE (EX ANETHOL), 10s. 6d. per lb.

AMYL ACETATE.—2s. per lb.

AMYL BUTYRATE.—5s. 3d. per lb.

AMYL SALICYLATE.—3s. per lb.

ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL BENZOATE.—2s. 3d. per lb.

CINNAMIC ALDEHYDE NATURAL.—17s. per lb.

COUMARIN.—10s. 6d. per lb.

CITRONELLOL.—14s. 6d. per lb.

CITRAL.—8s. 3d. per lb.

ETHYL CINNAMATE.—10s. per lb.

ETHYL PHTHALATE.—3s. per lb.

EUGENOL.—9s. 6d. per lb.

GERANIOL (PALMAROSA).—17s. 6d. per lb.

GERANIOL.—6s. 6d. to 10s. per lb.

HELIOTROPINE.—4s. 9d. per lb.

ISO EUGENOL.—13s. 6d. per lb.

LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.

LINALYL ACETATE.—Ex Bois de Rose, 18s. per lb. Ex Shui Oil, 14s. 6d. per lb.

METHYL ANTHRANILATE.—8s. 6d. per lb.

METHYL BENZOATE.—4s. 6d. per lb.

MUSK KETONE.—35s. per lb.

MUSK XYLOL.—8s. 6d. per lb.

NEROLIN.—3s. 9d. per lb.

PHENYL ETHYL ACETATE.—10s. 6d. per lb.

PHENYL ETHYL ALCOHOL.—11s. per lb.

RHODINOL.—27s. 6d. per lb.

SAFROL.—1s. 6d. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN.—18s. 6d. per lb. Good demand.

Essential Oils

ALMOND OIL.—11s. per lb.

ANISE OIL.—3s. 1d. per lb.

BERGAMOT OIL.—30s. per lb.

BOURBON GERANIUM OIL.—12s. per lb.

CAMPHOR OIL.—67s. 6d. per cwt.

CANANGA OIL, JAVA.—26s. per lb.

CINNAMON OIL LEAF.—6d. per oz.

CASSIA OIL, 80/85%.—8s. 6d. per lb.

CITRONELLA OIL.—Java, 85/90%, 2s. 3d. per lb. Ceylon, pure, 1s. 10d. per lb.

CLOVE OIL.—6s. per lb.

EUCALYPTUS OIL, 70/75%.—2s. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 21s. per lb.

LEMON OIL.—10s. per lb.

LEMONGRASS OIL.—4s. 6d. per lb.

ORANGE OIL, SWEET.—10s. 6d. per lb.

OTTO OF ROSE OIL.—Anatolian, 30s. per oz. Bulgarian, 70s. per oz.

PALMA ROSA OIL.—9s. 6d. per lb.

PEPPERMINT OIL.—Wayne County, 18s. 9d. per lb. Japanese, 8s. 6d. per lb. Firm.

PETITGRAIN OIL.—7s. 9d. per lb.

SANDALWOOD OIL.—Mysore, 26s. 6d. per lb.; 90/95%, 16s. 6d. per lb.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, April 13, 1927.

THE heavy chemical market continues moderately active but the volume of business placed has not been so large during the past week. There are one or two changes in prices to record, viz., an advance of 30s. per ton in the price of solid caustic potash, also an advance in carbonate of potash of 35s. per ton, and a reduction in the price of English calcium chloride of 12s. 6d. per ton.

Industrial Chemicals

ACID ACETIC.—98/100%, £55 to £67 per ton, according to quantity and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystal, granulated or small flakes, £34 per ton; powder, £36 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Still in good demand, and price advanced to about 7½d. per lb., f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Quoted 1s. 4d. per lb., less 5%, ex store, for Continental material. British material quoted 1s. 5d. per lb., less 5%, f.o.b. U.K. port.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. 9d. per carboy. Dearsenicated quality, 6s. 3d. per carboy, ex works.

ACID NITRIC, 80%.—Quoted £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Still in good demand. Price about 2½d. per lb., c.i.f. U.K. ports.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 2½d. per lb., less 5%, ex wharf, prompt shipment. Spot material offered at about 1s. 2½d. per lb., less 5%, ex store.

ALUMINA SULPHATE, 17 18%.—IRON FREE.—Spot material quoted £5 12s. 6d. per ton, ex store. On offer for early delivery at £5 5s. per ton, c.i.f. U.K. ports.

ALUM POTASH.—Lump quality quoted £8 per ton, c.i.f. U.K. ports. Crystal powder, 5s. per ton less. Lump on spot, £9 per ton. Crystal powder, £8 10s. per ton, ex store.

AMMONIA ANHYDROUS.—On offer at 9½d. per lb., ex store. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of English manufacture unchanged at about £23 to £24 per ton, ex station. Continental on offer at about £20 10s. per ton, c.i.f. U.K. ports. Fine white crystals quoted £18 5s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Spot material now quoted £19 5s. per ton, ex store. Offered for prompt despatch from mines at £18 5s. per ton, ex wharf.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals on offer from the Continent at £7 12s. 6d. per ton, c.i.f. U.K. ports, packed in casks. Bags 5s. per ton less. Spot material quoted £9 5s. per ton, ex store.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers, £8 per ton, ex station, minimum 4 ton lots. Spot material, 10s. per ton extra. Continental now quoted £7 10s. per ton, c.i.f. U.K. ports.

BORAX.—Granulated £19 10s. per ton; crystals, £20 per ton; powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacturers advise reduction in price of 12s. 6d. per ton. Price now £5 to £5 5s. per ton, ex station. Continental quoted £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports, for export.

COPPER SULPHATE.—Spot material of English manufacture on offer at about £24 per ton, ex store. Continental quoted £23 per ton, c.i.f. U.K. ports.

FORMALDEHYDE, 40%.—Now offered from the Continent at £38 per ton, c.i.f. U.K. ports. Spot material available at £39 10s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental now quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at £33 per ton, ex store.

LEAD, WHITE.—Quoted £33 5s. per ton, ex store.

LEAD ACETATE.—White crystals quoted £42 15s. per ton, c.i.f. U.K. ports; brown, about £40 5s. per ton, c.i.f. U.K. ports; white crystals on spot quoted £44 5s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

MAGNESIUM CHLORIDE.—Quoted £6 6s. 6d. per ton, c.i.f. U.K. ports.

POTASH, CAUSTIC, 88/92%.—Advanced 30s. per ton. Solid quality now quoted £28 15s. per ton, c.i.f. U.K. ports, minimum 15-ton lots.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Now quoted £27 5s. per ton, ex wharf, early shipment. Spot material on offer at about £28 10s. per ton, ex store.

POTASSIUM CHLORATE.—Powdered quality now quoted £24 10s. per ton, c.i.f. U.K. ports. Crystal £2 per ton extra.

POTASSIUM NITRATE.—Spot material on offer at £22 10s. per ton, ex store. Offered for prompt shipment from the Continent at about £21 per ton, c.i.f. U.K. ports.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 6½d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIAN (YELLOW).—In good demand, and price unchanged at about 7½d. per lb., ex store, spot delivery. Offered from the Continent at 7½d. per lb., c.i.f. U.K. ports.

SODA CAUSTIC.—Powder, 98/99%, £19 7s. 6d. per ton; 76/77%, £15 10s. per ton; 70/72%, £14 10s. per ton, carriage paid station, minimum 4-ton lots on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—English material quoted £22 10s. per ton, ex store. Continental on offer at about £19 per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. N.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powder or pea quality, £1 7s. 6d. per ton more; alkali, 59%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 10s. per ton, ex station, minimum 4-ton lots. Continental on offer at about £8 2s. 6d. per ton, ex wharf, prompt shipment. Pea crystals, photographic quality, of British manufacture, quoted £14 10s. per ton, ex station.

SODIUM NITRATE.—Ordinary quality quoted £13 per ton, ex store. Refined quality 5s. per ton extra.

SODIUM NITRITE, 100%.—Spot material now quoted £20 5s. per ton, ex store.

SODIUM PRUSSIAN (YELLOW).—Offered for prompt shipment from the Continent at 4½d. per lb., ex wharf. Spot material on offer at 4½d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption £3 7s. 6d. per ton, ex works.

SODIUM SULPHIDE.—60/65%, solid, £11 10s. per ton; broken, £12 10s. per ton; cakes, £12 10s. per ton; flake, £14 5s. per ton; crystals, 31/34%, £7 15s. to £8 10s. per ton, according to quality, delivered buyers' works, minimum 4-ton lots on contract. Prices for spot delivered are 5s. and 2s. 6d. per ton, extra for solid, and crystals respectively. Offered from the Continent at about £9 7s. 6d. per ton, c.i.f. U.K. ports; broken, 15s. per ton extra.

SULPHUR.—Flowers, £12 10s. per ton; roll, £11 10s. per ton; rock, £11 10s. per ton; floristella, £10 10s. per ton; ground American, £9 5s. per ton; ex store. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered 20s. per ton extra.

ZINC SULPHATE.—Continental material on offer at about £10 10s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates

GAMMA ACID.—5s. per lb., per 100%. Some inquiries.

PARANITRANILINE.—1s. 8d. per lb. Some inquiries.

SULPHANILIC ACID.—9d. per lb., per 100%. Small inquiries.

R. SALT.—2s. per lb., per 100%. Small inquiries.

BENZALDEHYDE.—2s. 3d. per lb. Some inquiries.

Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, April 13, 1927.

THE effect of the approaching holiday break has been to quieten still further the demand for chemical products during the past week on the Manchester market, and it is not unlikely that the influence of the holiday will extend over the greater part of next week. In most instances current business is made up of relatively small parcels, and there has been little tendency to extend commitments far ahead.

Heavy Chemicals

Bleaching powder continues to be offered here at £8 per ton, with the demand for this material on moderate lines. In the case of saltcake inquiry has been slow, but values keep up at from £3 10s. to £3 15s. per ton. The tone in respect of bichromate of soda is somewhat easier at about 3d. per lb., and here again buying interest is on a relatively limited scale. There has been a fairly steady demand for bichromate of soda, and quotations for this are steady at £10 10s. per ton. Nitrite of soda has been moving off in moderate quantities with offers ranging from £19 to £19 5s. per ton. There is only a quiet call for sulphide of soda, but values seem steadier, 60-65 per cent. concentrated solid being quoted at about £11 2s. 6d. per ton, and commercial material at £8 10s. A fairly steady trade is passing in caustic soda at continued firm prices, these ranging from £14 10s. to £16 10s. per ton, according to quality. Hyposulphite of soda is maintained at about £15 7s. 6d. per ton for photographic crystals, and £9 10s. for commercial quality, but the demand for this is rather quiet. There is a quietly steady demand in the case of alkali, and quotations are well held on the basis of £6 15s. per ton. Chlorate of soda remains quiet, and the tendency of prices is still easy at about 3d. per lb. Current quotations for phosphate of soda are around £12 17s. 6d. per ton, but inquiry for this material remains comparatively slow. There is a certain amount of interest being taken in prussiate of soda, values of which are quite steady in the neighbourhood of 4½d. per lb.

Although there has only been a quiet demand this week for permanganate of potash, values in this section of the market are steadying up again; B.P. quality is now quoted at 6d. to 6½d. per lb., and commercial at about 5½d. Caustic potash has also been advanced to £30 10s. per ton, and the demand in this case is on a fair scale. Carbonate of potash is steady and in moderate request at about £26 5s. per ton. There is only a quiet trade reported in the case of bichromate of potash, and sales are being effected at round 4½d. per lb. Chlorate of potash remains quiet and rather easy at from 3½d. to 3¾d. per lb. Yellow prussiate of potash keeps firm at 7½d. to 7¾d. per lb., and a moderate movement has been reported this week.

Sulphate of copper continues to meet with a fair inquiry, and prices are well held at about £25 per ton. Arsenic is a quiet section, and values are easier at £16 10s. per ton or thereabouts at the mines for white powdered, Cornish makes. The demand for acetate of lime is of moderate extent, and prices are on the easy side at £15 10s. to £15 15s. per ton for grey, with brown somewhat scarce and values steady at about £9. The same conditions apply in the case of acetate of lead, with white quoted at about £43 per ton and brown at £41 15s. Nitrate of lead shows little change on the week at round £39 per ton, but inquiry for this is rather slow.

Acids and Tar Products

Only a quiet trade has been reported this week in tartaric acid, but prices are firmer at 1s. 2¾d. per lb. Citric acid, also, shows continued strength, and values of this are now up to 1s. 4¾d. per lb. Acetic acid is still a steady section of the market and a fairly active one; for 80 per cent. commercial quality about £37 per ton is being quoted, with glacial on offer at round £67. Oxalic acid is still rather easy at 3d. to 3½d. per lb.

Pitch still fails to attract any substantial amount of interest from buyers, and the tendency remains weak, with quotations at round £3 17s. 6d. per ton. Solvent naphtha is also dull and easy at about 1s. 4d. per gallon. Creosote oil keeps steady and continues to meet with a fair inquiry at 7½d. per gallon. Crystal carbolic is actively inquired for, and values are firm at 8½d. per lb.

Nitrogen Products

Export.—During the past week the export position has remained unchanged. British producers continue selling on the basis of £10 17s. 6d. per ton, f.o.b. U.K. port in single bags. The demand from continental countries continues to absorb considerable quantities of the available supplies. In the United States a good move out of sulphate during March was reported with very small supplies available for prompt delivery. Stocks in the Far East, except in China, are diminishing. It appears that the central European consumption of sulphate of ammonia will not be reduced, in spite of the appearance of several new nitrogenous fertilisers on the market.

Home.—The home demand is quieter than is usual at this time of the year. This is due to large purchases during the winter months. In some parts of the country it is reported that orders for sulphate are smaller because merchants are restricting the extent of the credit they give their farmer customers. It seems likely that the deliveries during the consuming months, March-May, will be smaller than usual, but that the deliveries for the whole year will be over and above those for last year. This is the opinion that is gathered from large merchants in various parts of the country.

Nitrate of Soda.—Stocks of nitrate in various consuming countries are being absorbed, but not in sufficient volume to necessitate any unusual movement from Chile, where the accumulations of stock demonstrate that an early fall in price is imminent. Interest centres mainly in next year's prices. With the return to free selling, the large stock that is certain to be carried over, and the lower costs of production which the operation of the Guggenheim process presages, the price scale for the new fertiliser year will be looked for with unusual interest. Low speculative offers for forward position demonstrate that a large price cut is practically certain.

Latest Oil Prices

LONDON.—April 12.—LINSEED OIL, a quiet trade at about last day's prices. Spot, £31 10s.; April, £30 7s. 6d., paid and sellers at £30 10s.; May-August, £30 15s. paid; September-December, £31 12s. 6d. taken. RAPE OIL quiet. Crude extracted, £44 10s.; technical refined, £46 10s.; Japanese crude, £42. COTTON OIL steady. Refined common edible, £40 10s.; Egyptian crude, £34; deodorised, £42 10s. TURPENTINE quoted lower. Spot, 45s. 6d.; May-June, 46s.; and July-December, 47s. 9d. per cwt.

HULL.—April 12.—LINSEED OIL.—Spot and April, £31 2s. 6d.; May-August, £31 7s. 6d.; September-December, £31 17s. 6d. COTTON OIL.—Bombay crude, £32 10s.; Egyptian crude, £33 10s.; edible refined, £37 10s.; technical, £36 10s.; deodorised, £39 10s. PALM KERNEL OIL.—Crushed naked, 5½ per cent., £37 10s. GROUND NUT OIL.—Crushed, extracted, £44; deodorised, £48. SOYA OIL.—Extracted and crushed £33 10s.; deodorised, £37. RAPE OIL.—Crude extracted, £44; refined, £46 per ton, net cash terms, ex mill. CASTOR OIL and COD OIL unchanged.

Free Selling of Nitrate

THE following statement has been issued for the information of traders and agriculturists interested in the nitrate of soda industry in order to clear up any misunderstanding as to the effect of the reversion to free selling of Chilean nitrate of soda as against the present combined system of sales now coming to an end:

Free selling will be permissible from April 14, 1927, but no nitrate sold under that free system may leave Chile before June 16, 1927. Therefore, neither in Europe nor in any other consuming centre can Chilean nitrate of soda, sold under the free selling system, be available until about the middle of July at the earliest. This being so, the price of nitrate of soda to consumers for the present season, ending at latest June 30 next, cannot be affected by any new sales made under the free selling system from April 14 onwards. Consumers therefore can safely buy at present prices now, and up to July, for immediate use.

French Consumption of Ammonium Sulphate

THE consumption of ammonium sulphate in France during the last few years and in 1913 is shown by the following figures:—

	Production.	Import.	Export.	Consumption.
	Met. tons.	Met. tons.	Met. tons.	Met. tons.
1913	75,000	23,000	1,500	97,000
1920	50,000	29,500	500	79,000
1924	19,500	120,000	7,500	202,000
1925	117,000	130,000	9,000	261,000
1926	150,000	185,000	12,000	333,500

The above table indicates the large increase of the French consumption of ammonium sulphate. In the last two years Germany was by far the largest importer. Of the quantities imported by France in 1926, 180,000 tons are said to have been of German origin.

Silica Gel Corporation's Appeal

Previous Judgment Reversed

ON Tuesday the Court of Appeal, composed of the Master of the Rolls and Lords Justices Scrutton and Sargant, gave judgment in the appeal by the Silica Gel Corporation, of Westminster, S.W., from a judgment of Mr. Justice Rowlatt awarding to the plaintiffs in the action, the Medway Oil and Salvage Co., Ltd., £17,448 damages for the alleged breach of warranty by the defendants, in the supply and erection of a Silica Gel Refining unit plant at the plaintiffs' works in the Isle of Grain. The plaintiffs alleged that the plant failed to fulfil the conditions of work prescribed by the contract. The defendants denied liability.

The Court allowed the appeal, entering judgment for the defendants on the claim, with costs, and for defendants on the counter-claim for £3,250, with costs.

The Court held that no warranty could be implied into the contract so as to fix the defendants with responsibility.

Voluntary Liquidation of Manufacturing Chemists

THE statutory meeting of the creditors of Raimes and Co., Ltd., manufacturing chemists, of Stockton-on-Tees, was held recently, at the Queen's Hotel, Stockton-on-Tees, when the liquidator submitted a statement of affairs which disclosed liabilities of £23,628 os. 11d., made up as follows: trade creditors, £13,319 9s. 10d.; cash creditors, £10,206 10s. 6d.; and partly secured creditors, £102 os. 7d. The total claim of the latter was £9,699 7s. 1d., but they held securities valued at £4,167 13s. 10d., and debentures for £5,429 12s. 8d. The assets were estimated to realise £16,401 os. 11d., less £363 16s. 7d. for preferential claims, and £15,629 8s. 8d. due on debentures. The net assets therefore were £407 13s. 8d., or a deficiency of £23,220 5s. 3d. so far as the creditors were concerned. The issued capital of the company was £60,000, and as regarded the shareholders there was a deficiency of £83,220 5s. 3d. The liquidator stated that the figures were the estimates of the directors, but considered that upon a forced realisation, instead of £407 being available for the unsecured creditors, there would be a shortage of £5,448 so far as the debenture holders were concerned. A resolution was passed confirming the voluntary liquidation of the company with the liquidator already appointed, and it was decided that a committee should be elected consisting of Sir John Harrison and the representatives of the North Eastern Salt Co., Ltd., and Proctor and Co., Ltd.

Arsenic on American Apples

IN reply to a communication from the London Vegetarian Society with regard to the dangers of arsenic on apples coming from America, Mr. R. W. Dunlap, acting secretary to the Washington Department of Agriculture, states that intensive studies designed to control the spray residue of fruit were made during last producing season by Governmental and commercial agencies. A great improvement in the condition of the crop was brought about, but it was found that in certain areas of low rainfall, even the most careful restriction in the application of sprays, followed by brushing and wiping the fruit after harvest, left excessive quantities of residue on the fruit. By the employment of certain dipping methods the fruit may be cleaned to a point where the amount of residue will be well below the recognised tolerance, and steps are now being taken to advise the fruit-producing industry in those regions where fruit-cleaning is essential, of the equipment and processes necessary.

Inflammability of Coal Dusts

A PAPER by Mr. A. L. Godbert, entitled "Laboratory Methods of Determining the Inflammability of Coal Dusts" (Safety in Mines Research Board, Paper No. 31, H.M. Stationery Office, 1s. 6d.), which has just been published, contains a historical survey of the subject, a review of the influence of various factors on the inflammability of dust clouds, and a discussion of the relative inflammabilities of coal dusts. It indicates the lines of further researches now proceeding in the Board's laboratories at Sheffield, and should be regarded as preliminary to a full report on the results of those researches.

Borough Polytechnic Institute

THE annual exhibition of students' work was held at the Borough Polytechnic Institute, London, on Saturday, March 26, when much interest was shown by the visitors in the new chemical laboratories. The two new laboratories were in use during the last winter session and are exceedingly well designed and equipped; visitors to the exhibition were able to see the kind of work carried on there. An exhibit which attracted much admiring attention showed the raw materials and processes of manufacture and application of nitrocellulose lacquers. The textile classes were also well represented by a series of specimens of woven and knitted fabrics and a comprehensive range of samples showing stages in the manufacture of artificial silk and other goods.

Experiments on combustion, crystallisation, calorific values of food and fuels were also shown, and in the organic section apparatus was in use illustrating distillation by steam and in vacuo, the manufacture of dyestuffs, etc. Mention must also be made of the large working models of Lime soda and Zeolite water softeners kindly lent to the department by Wilson and Perrett. An interesting and instructive display was also given in the Oils and Colours Department. Here students were carrying out actual experiments in varnish making, paint grinding, and other processes in which instruction is given in the department. Some beautiful pigments and other products were also exhibited.

Low Temperature Carbonisation for Canadian Coal

Low temperature carbonisation of coal on a large commercial scale is proposed for Canada, according to an announcement at Ottawa. A syndicate, headed by Mr. Morgan J. O'Brien, is applying to Parliament for a Federal charter for a three million dollar corporation. Plans are said to be practically complete for the construction of three 1,000-ton per day plants, one to be in Ottawa and two in Western Ontario. These plants would be operated by subsidiary companies, and steps are being taken for the organisation of other subsidiary companies to operate plants in Montreal and Quebec. The proposal is to carbonise Canadian slack coal by the low-temperature process which has been made commercially successful in England. A smokeless fuel, said to be equal to the anthracite coal now being sold on Canadian markets, would be produced, as well as gas and oil by-products. The process is applicable to all bituminous coals, and Mr. O'Brien stated that it is the intention to convey Nova Scotia coal to Ontario and Quebec by water during the open season of navigation, while Alberta coal will be treated in the west.

"The Rising Generation"

ON Monday evening, at King George's Hall, London, the Benn Brothers' Dramatic Society gave their annual performance before a crowded audience, which included Sir Ernest and Lady Benn, Elizabeth Lady Benn, Mr. and Mrs. Henry Benn, Mr. and Mrs. C. E. Hughes, Mr. E. E. Starke, Mr. H. B. Crole-Rees, Mr. and Mrs. A. R. Pain. The piece selected was "The Rising Generation," a three-act comedy by Wyn Weaver and Laura Leycester. The caste, which was entirely made up of members of the editorial, advertising and publishing staffs, effectively brought out all the humorous qualities of the comedy, and the play was watched with unbroken interest from beginning to end. At the conclusion of the performance Sir Ernest Benn congratulated the players on what was regarded as their best performance, and presented flowers to lady members of the caste.

The Oil and Colour Chemists' Handbook

WOLF-SCHLICK'S *Taschenbuch für die Farben- und Lackindustrie* has been translated into English by Mr. W. H. Hilton-Brown, and is now published under the title of *The Oil and Colour Chemists' Handbook* (The Trade Papers Publishing Co., Ltd., pp. 176, 10s. 6d.). The contents are in four main parts: pigments; varnishes, boiled oils, and driers; oil paints and enamels; and the examination and analysis of varnishes, paints, etc. These subjects are subdivided into a considerable number of sections, in which the matters under discussion are treated in detail. A number of useful tables are incorporated in the book. The methods described are in some cases not identical with those used in this country, the book accurately representing the German view.

Company News

SADLER & Co.—An interim dividend of 3 per cent. has been declared.

WEARDALE LEAD Co.—A dividend at the rate of 3½ per cent. (9d. per share), less tax at 4s., is payable on April 17.

TARAPACA AND TOCOPILLA NITRATE Co., LTD.—The directors report that owing to the unsatisfactory position of the nitrate industry and the uncertainty of its future, they have decided not to recommend the distribution of any dividend in respect of the year 1926. This makes two years in succession for which there has been no dividend, 1925 also being a blank period for shareholders. For 1924 there was a distribution of 10 per cent.

TARMAC, LTD.—The net result for the year ended December 31, 1926, is a loss of £6,202, to which must be added the provision for income tax based on the average of the last three years of £23,500, making a loss of £29,702. The balance of profit brought forward amounts to £16,882, and the directors have transferred from reserve account £40,000, leaving a balance for disposal amounting to £27,180. The dividend paid on the preference share capital for the half-year ended June 30, 1926, absorbs £5,500, and the directors have written off as depreciations £18,124, leaving a balance of £3,555. After allowing for directors' fees at half the rate voted in respect of 1925, £1,750, there remains £1,805 to carry forward.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICAL AND PHARMACEUTICAL PRODUCTS.—An Indian firm of importers, exporters, etc., established in the Bombay Presidency, is desirous of undertaking the representation in that area of British manufacturers, etc. (Reference No. 366.)

VEGETABLE AND ANIMAL FATS AND OILS (PALM OIL, COCOANUT OIL, CHINESE WOOD OIL, SOYA OIL, LINSEED OIL, COTTON SEED OIL, WHALE OIL AND SEAL OIL).—A firm in Prague desires to secure the representation, on a commission basis, of British exporters. (Reference No. 377.)

SHELLAC AND MERCURY.—An agent in Berlin desires to represent British manufacturers. (Reference No. 379.)

Report of the Imperial Institute

The report for 1926 of the Imperial Institute, South Kensington, London—the first report issued since the reorganisation which commenced on January 1, 1926—has been issued. The Institute is intended to serve as a central clearing house for the whole Empire for information relating to raw materials, and the reports of the Intelligence Sections indicate the extensive use which is made of the facilities offered by the Institute in this respect. Typical examples of the inquiries received related to Empire sources of bromine, helium, quartz, fluorite, and Iceland spar; the sources and uses of lithium; the low-temperature carbonisation and briquetting of New Zealand lignite; the utilisation of slate waste; and the manufacture of charcoal in Kenya. The products investigated included oils and oilseeds, essential oils and fibres from various sources; clays, bituminous oil and lignites from Nigeria; coal, clay, and limestones from Nyasaland; China Clay and mineral pigments from South Africa; and iron ores from Sierra Leone.

Canada Cement Company to Mine Gypsum

AN announcement that the Canada Cement Co. will shortly commence extensive gypsum mining developments on the north side of Antigonish Harbour has been made by Mr. E. N. Halton Fyles, geologist, of Montreal, who has been making a study of the areas for some time. Some 24 properties have been taken up by the company, and work will commence as soon as the frost is out of the ground this spring. The construction work will include shipping piers, storage plant, crusher, and railway lines to the quarries.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Gee & Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to April 30, 1927.

"ICVL."

477,593. Synthetic dyestuffs, for use in dyeing. Class 1. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester; manufacturers. February 8, 1927.

"PERSEX."

477,741. Class 4. Bitumen, raw or partly prepared for use in manufactures. Shields and Ramsey, Ltd., 104, West George Street, Glasgow; manufacturers. February 12, 1927.

"CETONIA."

476,971. Class 4. Raw or partly prepared, vegetable, animal, and mineral substances used in manufactures. L. Givaudan and Co., 36, Rue Ampere, Paris, France; manufacturers. January 27, 1927.

Opposition to the Registration of the following Trade Marks can be lodged up to May 6, 1927.

"TRIPWHITE."

476,260. Class 1. Chemical substances used in manufactures. B. Laporte, Ltd., The Chemical Works, Kingsway, Luton, Bedfordshire; chemical manufacturers. December 30, 1926.

"MANDALAC."

477,269. Class 1. Paints, varnishes and enamels. Mander Brothers, Ltd., St. John's Street, Wolverhampton; manufacturers. January 31, 1927.

"CADMOPONE."

477,407. Class 1. Pigments, paints, colours and cadmium sulphide for use in manufactures. H. W. D. Ward, Ltd., The Chemical Works, Watling Street, Bletchley; manufacturers. February 3, 1927.

Tariff Changes

BOLIVIA.—A recent Decree provides for the duty-free import into Bolivia of quinine sulphate and hydrochlorate, formerly dutiable at 15 per cent. *ad valorem*.

POLAND.—The Customs duty on calcium cyanamide imported into Poland has been suspended for three months, as from February 28, by an order dated February 21. With reference to previous notices under dyes and chemicals, it should be noted that the Customs duty on imported dyestuffs and chemicals used in the manufacture of coloured woollen yarn, No. 20 metric and above, for export from Poland, will be refunded at the rate of 36 zloty per 100 kilogs., in virtue of an Order dated February 25, and effective as from March 4.

SERB-CROAT-SLOVENE KINGDOM.—In virtue of a Decision of the Council of Ministers of the Serb-Croat-Slovene Kingdom, effective as from March 4, the import duty on copper sulphate (Tariff No. 215 (2)) has been suspended, and the import duty on refined sulphur and flowers of sulphur (Tariff No. 197 (2)) has been reduced from 1.50 to 0.75 gold dinars per 100 kilogs., for the period ending June 30, 1927.

BELGIAN CONGO.—In virtue of a Decree which came into force on January 1 last, the duties levied on salt, lime, and cement on importation into the Belgian Congo have been increased.

Chilean Nitrate or Ammonium Sulphate

In recent years Germany has largely discontinued the use of Chilean nitrate as a fertiliser in place of home produced sulphate of ammonia. At a meeting of the Manures Commission of the Prussian Ministry of Agriculture, Dr. Ramin, Minister for Agriculture, strongly advocated a diminution of the use of sulphate of ammonia, saying that the acidification of the soil thereby caused produced as a consequence an extraordinary falling off in the yields. During subsequent discussion it was stated that acidification of the soil followed upon continuous use of sulphate of ammonia when not corrected by a sufficiency of lime.



THE EYES OF THE CHEMICAL WORLD

are eagerly watching the daily increase in the application of Firth "Staybrite"—the last word in corrosion-resisting steels suitable for cold or hot press work.

Discerning engineers up and down the country, and in fact in many parts of the world, are making enquiries, testing and heartily endorsing this wonderful material.

Yesterday a leading chemical firm commenced the erection of a large tank for the storage of one of the most corrosive acids.

To-day a great brewery adopts "Staybrite" as the best material ever invented for yeast tanks and other purposes.

To-morrow, it may be, the enquiries of a manufacturer of ice-cans, motor radiator shells, condenser tubes or vital parts for some chemical or engineering plant, will lead to still another successful application of "Staybrite."

Our whole experience in the manufacture and application of "Staybrite" is at your disposal without obligation.

THOS. FIRTH & SONS, LTD., SHEFFIELD

FIRTH "STAYBRITE"

(the super-rustless and super-malleable steel) possesses the quality of resistance to the corroding effects of moisture, sea water, many acids (including nitric), vinegar and many organic agents.

With a yield point of about 12 to 15 tons per square inch and an elongation of 55% to 70%, "Staybrite" has exceptional ductility combined with maximum corrosion-resisting qualities, which it possesses to a remarkable degree. It may be cold pressed far in advance of the so-called "stainless iron," and, moreover, presents no difficulties in manipulation, since it may be welded, rivetted, soldered and brazed without trouble.

Firth "Staybrite" is supplied in the form of descaled Sheets and Strip, Bars, Plates, Structural Sections, Tubes, Wire, Forgings and Castings.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

BILLING (CHARLES) AND CO., LTD., London, W.C., soap manufacturers. (M., 16/4/27.) Registered March 30, £1,000 debenture, to A. J. Bennett, Kirklington Hall, Southwell, M.P.; general charge.

FOSTER, MASON AND HARVEY, LTD., London, S.E., paint manufacturers, etc. (M., 16/4/27.) Registered March 29, £3,500 Land Registry charge, to Bank; charged on land, warehouse, etc., in Bermondsey. *Nil. January 14, 1927.

GRAY (ERNEST) AND CO. (1924), LTD., East Molesey, dental wax manufacturers. (M., 16/4/27.) Registered March 26, £200 debenture, to C. Hughes, Tona, South Road, Chorley Wood, company director; general charge. *Nil. December 24, 1926.

HAIGH DYEING CO. (1920), LTD., Wigan. (M., 16/4/27.) Registered March 28, £17,000 1st debenture, to R. Dobson and another, Mosley Street, Manchester; general charge (excluding uncalled capital). *£20,073 17s. 5d. June 10, 1926.

HEPPELS, LTD., London, S.W., chemists. (M., 16/4/27.) Registered March 30, collateral security (supplemental to deed dated December 22, 1924, and further charges) securing amounts due under said deed, etc., and any additional advances, to F. J. M. Pyne and another, 15, Lombard Street, E.C., bank managers; charged on shops and premises, 164 and 165, Piccadilly, W., and basement. *£199,300. November 29, 1926.

PLYMOUTH OXYGEN CO., LTD. (M., 16/4/27.) Registered March 29, £1,000 (not ex.) debenture (ranking next after £5,000 debenture already registered), to E. Marginson, 2, Fernleigh Terrace, Homepark, Saltash; general charge.

Satisfaction

HAIGH DYEING CO. (1920), LTD., Wigan. (M.S., 16/4/27.) Satisfaction registered March 29, all moneys, etc., registered October 21, 1922.

London Gazette, &c.

Companies Winding Up Voluntarily

"C.D." OILS, LTD. (C.W.U.V., 16/4/27.) By special resolution, March 2, confirmed March 23, F. Leates, incorporated accountant, appointed liquidator.

PRICHARD AND CONSTANCE WHOLESALE, LTD. (C.W.U.V., 16/4/27.) By special resolution, March 14, confirmed March 31, S. S. Evans, chartered accountant, Bush House, Aldwych, appointed liquidator. Meeting of creditors at the offices of Louis Nicholas and Co., chartered accountants, Bush House, Aldwych, W.C.2, Wednesday, April 20, at 2.30 p.m. (This notice is only formal; all creditors have been, or will be, paid in full.)

New Companies Registered

CONSOL PRODUCTS (EXPORT), LTD., 35, Parliament Street, Westminster, S.W.1. Registered April 8. Nom. capital, £1,000 in 1s. shares. Objects: To carry on the business of exporters and manufacturers of, agents for and dealers in, essences, cordials, powders, extracts and flavouring materials of all kinds. Directors: J. W. Schofield, A. Barnes.

THE SHROPSHIRE BEET SUGAR CO., LTD., 87, Bishopsgate, London, E.C.2. Registered as a "public" company on April 7. Nom. capital, £373,500 in 332,000

10 per cent. non-cumulative preferred ordinary shares of £1 each and 332,000 deferred ordinary shares of 2s. 6d. Manufacturers and preparers of and dealers in sugar, sugar beet, and all kinds of vegetable products or other substances from which sugar is or may be extracted, industrial, manufacturing and general chemists, etc.

An American Firm's Century

EXACTLY one hundred years ago, at Salem, Massachusetts, Mr. Joseph Dixon laid the foundation of the vast organisation which to-day bears his name. Born at Marblehead in 1799, his inventive ability soon manifested itself in a machine for cutting files. By the time he was twenty-one he was regarded in New England as an expert chemist. He studied medicine but, losing faith in drugs, took up the business of an optician and made lenses, grinding them with the aid of graphite. Dixon claimed to be the first man to produce a portrait by means of a camera, and the first to build a locomotive with a double crank. He perfected the process of lithography. He invented a scheme of printing bank notes in colours. He had the rare capacity for making money out of his blunders and failures. If he did not always find the thing he was working for, he usually got something just as good. When using graphite he found that he got his hands and face thoroughly well blacked. This gave him the idea for making graphite pencils instead of lead ones. In 1847 Dixon moved to Jersey City. He bought prairie land at fifty dollars an acre, and started his business of making crucibles, stove polish, and pencils. In 1867, realising that his strength was failing, he formed a corporation known as the Joseph Dixon Crucible Co. Two years later he died. To-day with sales organisations in all the leading capitals, the business he founded is known throughout the world.

Japanese Synthetic Ammonium Sulphate

THE Nippon Chisso Kaisha (Japan Nitrogen Co.) is increasing the annual capacity of its Nobeoka plant from 20,000 tons of sulphate of ammonia to 50,000, and its Mizumata plant from 30,000 tons to 50,000 tons, in addition to which it proposes shortly to erect in Chosen (Korea) a plant with an annual capacity of 100,000 tons. The Dai Nippon Jinzo Hiryo Kaisha (Great Japan Artificial Fertiliser Co.) is making plans for a plant to be constructed in Toyama prefecture with a capacity of 25,000 tons of sulphate of ammonia annually. The Denki Kagyo Kaisha (Electro-Chemical Manufacturing Co.) has doubled its capital for the announced purpose of establishing a plant for the production of 30,000 tons of sulphate of ammonia per annum. The production of sulphate of ammonia in Japan during 1925 amounted to approximately 130,000 tons, so that when the projected developments above referred to are completed production will be doubled. The consumption of sulphate of ammonia in Japan increased from 120,000 tons in 1914 to 330,000 tons in 1925, and is expected to reach 400,000 tons for 1926. In 1925 the portion of the requirements of the market supplied by imports amounted to 60 per cent. There is a similar increase in the demand for sulphate of ammonia in Chosen and Toiwan.

Benn Brothers' Other Journals

THE CABINET MAKER.—Rag Flock—Facts for the Public; Furnishing and Decoration aboard the new motor liner *Alcantara*; Notes from the Home Journals; Furnishing Displays in Liverpool and Manchester.

THE ELECTRICIAN.—"The Assessment of Cable Quality," by G. W. Preston; Electricity in Brewing; Installation Problems.

THE FRUIT GROWER.—"Small Holdings and Allotments Legislation," by "Barrister-at-Law"; Imperial Show Prizes for Packers; Markets and Fairs.

GARDENING ILLUSTRATED.—Dwarf Asters for Spring Planting; Irises in Japan; The Gooseberry Sawfly; Cultivation of Scarlet Runner Beans.

THE GAS WORLD.—Moving a Gasworks at Dumbarton; About Gas Affairs in New Zealand; The Wet Gas Meter.

THE HARDWARE TRADE JOURNAL.—Metal Price Fluctuations; Monthly Chart; Wire Production in Great Britain; The Hardware Retailer and His Wireless Section.

THE TIMBER TRADES JOURNAL.—Estonian Forests and their Products; Uniform Contract and Freight Advances; Woodcraft.

